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SITE CHARACTERIZATION REPORT AND ACTION PLAN FOR ITT FACILITY

BURBANK, CALIFORNIA

2 NOVEMBER 1989
2588-08-01





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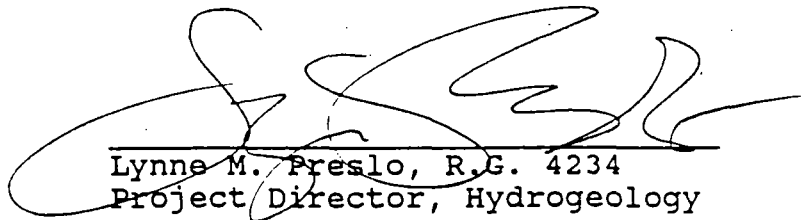
W.O. No. 2588-08-01

Prepared by:

Roy F. Weston, Inc.
1350 Treat Blvd., Suite 200
Walnut Creek, California 94596




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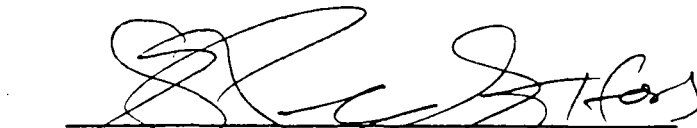
Lynne M. Preslo, R.G. 4234
Project Director, Hydrogeology



Susanne Kraemer
Project Manager



Melitta Rorty
Project Geologist



Steve Werner
Vice President

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
1	INTRODUCTION	1-1
	1.1 Scope of Work	1-1
	1.2 Site History	1-1
	1.3 Objectives	1-4
2	SUMMARY OF INVESTIGATIONS TO DATE	2-1
	2.1 Work Performed by Harding Lawson Associates	2-1
	2.2 Work Performed by Leroy Crandall and Associates	2-1
	2.3 Work Performed by A.L. Burke Engineers, Inc.	2-2
3	REGIONAL GEOLOGY AND HYDROGEOLOGY	3-1
	3.1 Physiography	3-1
	3.2 Regional Geology	3-1
	3.3 Regional Hydrogeology	3-3
	3.3.1 Water-Bearing Units	3-3
	3.3.2 Geographic Distribution of Water-Bearing Zones	3-5
4	SITE GEOLOGY AND HYDROGEOLOGY	4-1
	4.1 Site Geology	4-1
	4.2 Site Hydrogeology	4-7
5	SOILS INTERPRETATION	5-1
	5.1 Work to Date	5-1
	5.2 Database Inventory	5-2
	5.3 Correlation of Stratigraphy and Chemical Concentration	5-2
	5.3.1 VOCs in Soils	5-3
	5.3.2 Metals in Soils	5-3
	5.4 Recommended Sampling Locations for Background Soil Samples	5-5

TABLE OF CONTENTS (Cont.)

<u>Section</u>		<u>Page</u>
6	ACTION PLAN	6-1
6.1	Additional Investigation	6-1
6.1.1	Soil-Gas Screening	6-2
6.1.2	Soil Borings and Soil Sampling	6-2
6.2	Outline of Closure Requirements	6 - 4
7	REFERENCES	7-1
APPENDIX A:	BORING LOGS FROM PREVIOUS INVESTIGATIONS	A-1
APPENDIX B:	DATABASE INVENTORY	B-1
APPENDIX C:	QA/QC PLAN	C-1
APPENDIX D:	HEALTH AND SAFETY PLAN	D-1
APPENDIX E:	SAMPLING AND ANALYSIS PLAN	E-1

LIST OF FIGURES

<u>Figure Number</u>	<u>Description</u>	<u>Page</u>
1-1	Area Location Map for ITT	1-2
1-2	Site Map, ITT Facility	1-3
2-1	Location of Previous Soil Borings in Building 2	2-4
2-2	Location of Previous Soil Borings in in Building 3	2-5
3-1	Physiography Map, San Fernando Valley	3-2
3-2	Soil Map, San Fernando Valley	3-4
4-1	Geologic Cross-Section A-A', Building 2	4-2
4-2	Geologic Cross-Section B-B', Building 2	4-3
4-3	Geologic Cross-Section C-C', Building 3	4-4
4-4	Geologic Cross-Section D-D', Bright Dip Sump Area, Building 3	4-5
4-5	Locations of Geologic Cross-Sections	4-6
5-1	Proposed Locations for Collection of Background Soil Samples	5-6
6-1	Proposed Areas for Soil-Gas Screening	6-3

LIST OF TABLES

<u>Table Number</u>	<u>Description</u>	<u>Page</u>
5-1	STLCs and TTLCs for CAM Metals	5-4
5-2	Range of Metals in Natural Soils	5-8

Section 1

SECTION 1

INTRODUCTION

1.1 SCOPE OF WORK

This technical report presents information on studies performed at the ITT Aerospace Controls Division site in the San Fernando Valley. The site is located at 1200 South Flower Street, bounded by Alameda Avenue, Flower Street, Allen Avenue, and the Southern Pacific Railroad Mainline in Burbank and Glendale, California (Figure 1-1). The principal area of previous investigations was in the vicinity of Buildings 2 and 3 (Figure 1-2), where a program of surface and subsurface sampling activities for the purpose of locating and closing underground storage tanks (USTs) was conducted by A.L. Burke Engineers, Inc. (ALB). The tasks described in this report were presented in the proposal entitled "Services Related to Site Assessment, Planning, Remediation Selection, Design, and Implementation" (WESTON, 13 June 1989), and the addendum to that proposal (WESTON, 27 June 1989). Work on these tasks began on 9 August 1989.

Following this introduction, Section 2 presents a summary of investigations to date. Regional geology and hydrogeology are discussed in Section 3, site-specific geology and hydrogeology are discussed in Section 4, and the interpretation of soils data is presented in Section 5. The action plan to complete subsurface characterization and prepare the site of Buildings 1, 2 and 3 for demolition is presented in Section 6. The Quality Assurance/Quality Control Plan, the Health and Safety Plan, and the Sampling and Analysis Plan for this subsequent work are presented in the appendices.

1.2 SITE HISTORY

The ITT site consists of 11.7 acres of land. At the present time, two divisions of ITT are at the site: ITT Aerospace and ITT General Controls. ITT General Controls has completed relocation from the site as of September 1989.

Prior to industrial use, the land was residential property (ITT, personal communication). General Controls purchased the property in the early 1930's, and a variety of processes have been performed at the facility since that time.

ITT purchased General Controls in 1963. In 1986, ITT initiated a tank removal program in order to demolish existing structures and prepare for construction of new facilities. In 1987, ITT Aerospace

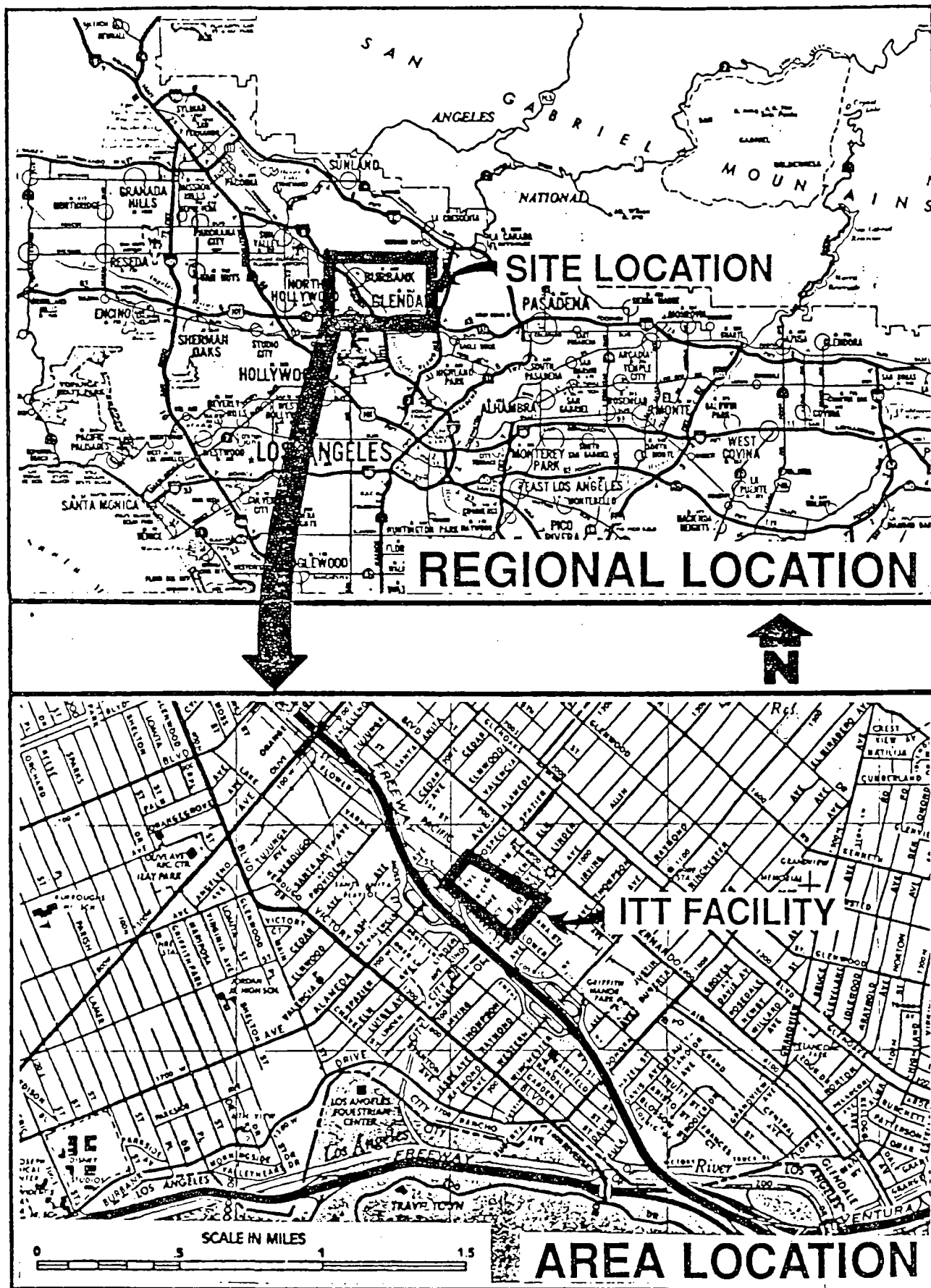


FIGURE 1-1 AREA LOCATION MAP FOR ITT FACILITY

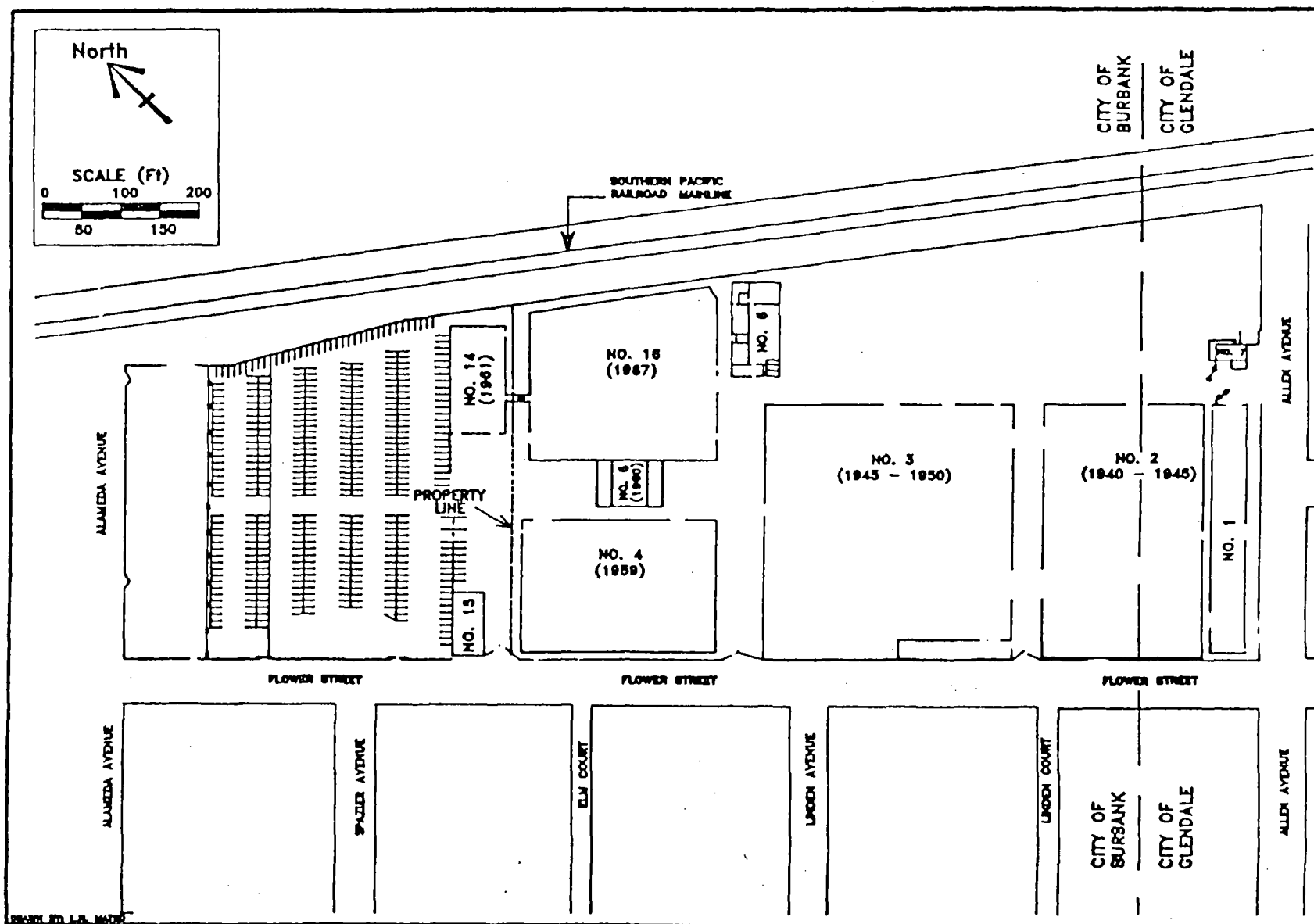


FIGURE 1-2 SITE MAP - ITT AEROSPACE CONTROLS FACILITY, BURBANK, CA.

Controls assumed responsibilities for the areas formerly occupied by ITT General Controls, and proposed to build a new building on the site of Buildings 1, 2, and 3. Buildings 10 and 12 were demolished in 1988, while Buildings 8, 9, 9A, and 13 were demolished in 1989. Approximately five USTs were removed with the approval of the City of Burbank and the City of Glendale Fire Departments prior to demolition of these buildings.

As stated above, the present investigation focuses on the area of Buildings 1, 2, and 3. Building 1 was used for administrative purposes. ITT General Controls used Building 2 as a machine shop. Parts were machined in Building 2, but not assembled there. Items of production included primarily thermostats, residential and commercial gas valves, and oil field steam valves. Different machining processes were used over the years. Most of these operations were discontinued in 1986, although the parts washer in Building 2 was used until 1988. Processes over the years have used trichloroethene (TCE), perchloroethylene, 1,1,1-trichloroethane (1,1,1-TCA), diesel fuel, butane, kerosene, cutting oil, motor oil, sulfuric acid, nitric acid, and muriatic acid, among others.

A well is located in Building 2, although it is no longer in use. Based on field measurements, the well appears to be silted in to a depth of about 31 feet. No chemical analyses are available. It was used as a water supply for the parts washing operations that were performed outside in the area of Building 9A.

While ITT General Controls used Building 3 for parts assembly and storage in the past, operations are no longer performed there. Different processes have been performed in Building 3 since the early 1950's, and include parts assembly, heat treating, rock tumbling, impregnating, degreasing, metal finishing, plating, wastewater treatment, welding, and painting. Over the years, processes have used trichloroethene (TCE), perchloroethylene, isopropyl alcohol, sodium cyanide, zinc cyanide, barium carbonate, zinc chloride, chromic acid, nitric acid, sulfuric acid, and muriatic acid, among others.

1.3 OBJECTIVES

The overall objectives of this current study were 1) to evaluate environmental studies performed to date at the ITT site and, 2) to develop an appropriate action plan to complete the characterization of the site in preparation for construction on the site. To achieve these objectives, the following key elements were completed:

1) The following reports and information were reviewed:

- Data compiled by A.L. Burke Engineers, 1988 and 1989.

- Environmental Engineering Consultants, Evaluation of the Data obtained by A.L. Burke Engineers, Inc., for Soil Conditions at Bldg. 2 and Bldg. 3, ITT General Controls Division, April 1989.
 - Harding Lawson Associates, Site Assessment, Underground Tank Leakage, Aerospace Facility, June 1986.
 - Leroy Crandall and Associates, Report of Preliminary Foundation Investigation, Proposed Administration/Manufacturing Building, Flower Street between Alameda Street and Allen Avenue, May 1988.
- 2) A database inventory was performed on data compiled by A.L. Burke Engineers. The database inventory consisted of a quality review and comparison of tabulated results, chain-of-custody forms, laboratory reports, and boring logs for consistency and proper procedures. Original logs are included in Appendix A, while these data inventories are included in Appendix B.
 - 3) A site characterization report was prepared from available information. Boring logs from A.L. Burke Engineers work were used to develop four geologic cross-sections that illustrate the subsurface conditions above the water table at the site. Representative logs in key areas with samples at depth were selected for these cross-sections. Additionally, chemical concentrations detected in samples from those borings were marked on the cross-sections to illustrate the distribution of the types of chemicals in the subsurface at the site.
 - 4) Interviews with site personnel were conducted to obtain additional information on previously performed work and the site history.
 - 5) Historical sampling events were reconstructed, resulting in a revised plot plan and a post-facto sampling plan for the project files.
 - 6) An action plan then was developed to achieve ITT's goals listed above. The action plan consists of recommendations for further work to complete site characterization and regulatory closure requirements for the below-grade sumps in the area of Buildings 2 and 3 in preparation for construction at the site.
 - 7) Additionally, in preparation for the subsequent work recommended in the action plan, Health and Safety, Quality Assurance/Quality Control (QA/QC), and Sampling and Analysis Plans were prepared.

Section 2

SECTION 2

SUMMARY OF INVESTIGATIONS TO DATE

Previous investigations of the site were performed by Harding Lawson Associates (HLA), Leroy Crandall and Associates (LCA), and A.L. Burke Engineers (ALB). The following sections describe the work performed and the findings of those investigations.

2.1 WORK PERFORMED BY HARDING LAWSON ASSOCIATES

As part of an UST removal program, Harding Lawson Associates (HLA) performed a site assessment during 1986 in the vicinity of Building 16 on the ITT facility (Figure 1-2). At that location, a concrete sump, a titanium tank, and a steel tank were removed from the facility. The tanks were reported to have contained coolant and hydraulic and cutting oils. HLA collected soil samples from the base of the excavation under each tank. Analytical results indicated the presence of petroleum hydrocarbons and volatile organic compounds beneath the tanks. As a result of these findings, additional site investigation work was initiated.

The additional work consisted of three borings that were drilled and sampled adjacent to the excavated areas to evaluate the areal and vertical extent of the chemicals. Borings were drilled to a depth of 45 feet to 50 feet below the ground surface using 8-inch diameter hollow stem augers. Groundwater was not encountered during drilling. Sandy silt was encountered from ground surface to about 6 feet below ground surface, sand was encountered from about 6 feet to 45 feet below ground surface, and a clayey silt was encountered from 45 feet to 50 feet in the one boring that was drilled beyond 45 feet.

Composite sample results for this additional work indicated that compounds stored in the tanks were not present in the underlying soils.

2.2 WORK PERFORMED BY LEROY CRANDALL AND ASSOCIATES

Leroy Crandall and Associates (LCA) performed a preliminary foundation investigation for the proposed construction at the site of Buildings 1, 2, and 3. This work was performed in May 1988, and consisted of standard geotechnical tests. Three borings were drilled to a depth of 40 feet below ground surface using 20-inch diameter bucket-type drilling equipment. Standard geotechnical tests, consisting of field moisture content, dry density, direct shear, confined consolidation, optimum moisture content, maximum dry density, and California Bearing Ratio Tests, were performed on

collected samples. Saturated conditions were encountered in one of the borings at a depth of 38 feet below ground surface. This boring was located at the southern corner of Building 6.

2.3 WORK PERFORMED BY A.L. BURKE ENGINEERS, INC.

With regard to the work performed by ALB, the following elements were reviewed or performed:

- 1) Data compiled by A.L. Burke Engineers, 1988 and 1989.
- 2) J. Cotter's review of the above work products (Environmental Engineering Consultants, April 1989).
- 3) Interview with ALB on 11 September 1989.

The purposes of the investigations performed by ALB were to 1) identify areas of Buildings 2 and 3 where compounds associated with the operations at the plant could be present, 2) assess the areal and vertical extent of the compounds, and 3) locate sumps and/or tanks used in those buildings.

Numerous soil samples were collected during the investigations of Buildings 2 and 3 (Figures 2-1 and 2-2). For the work performed at Building 2, approximately 137 chemical analyses were performed. The majority of these samples were collected at various depths from soil borings. For the work at Building 3, approximately 188 chemical analyses were performed. The samples consisted of surficial soil samples, soil samples from soil borings, sludge samples, oil samples, and concrete core samples.

Analytical results from these investigations indicate three primary areas for follow-up work in the two buildings. The first is in Building 3 in the Bright Dip Sump area. The sump located in the northern portion of Building 3 was lined with concrete, the integrity of which has deteriorated. In this area, tetrachloroethene (or perchloroethylene) was detected at 120,000 ug/kg at 20 feet in Boring 3-118, and at 30,000 ug/kg at 15 feet in Boring 3-117. The second area is in the plating area of Building 3, where tetrachloroethene was detected at 10,000 ug/kg at 21 feet in boring 3-110, and some metals (barium, lead, chromium, mercury) were detected in some samples. Only one boring (boring 3-104) contained only one metal (chromium) at concentrations greater than its Total Threshold Limit Concentration (TTLC). The third area is in the southern corner of Building 2, where tetrachloroethene was detected at 36,000 ug/kg in the soil sample collected from boring 32 at a depth of 30 feet.

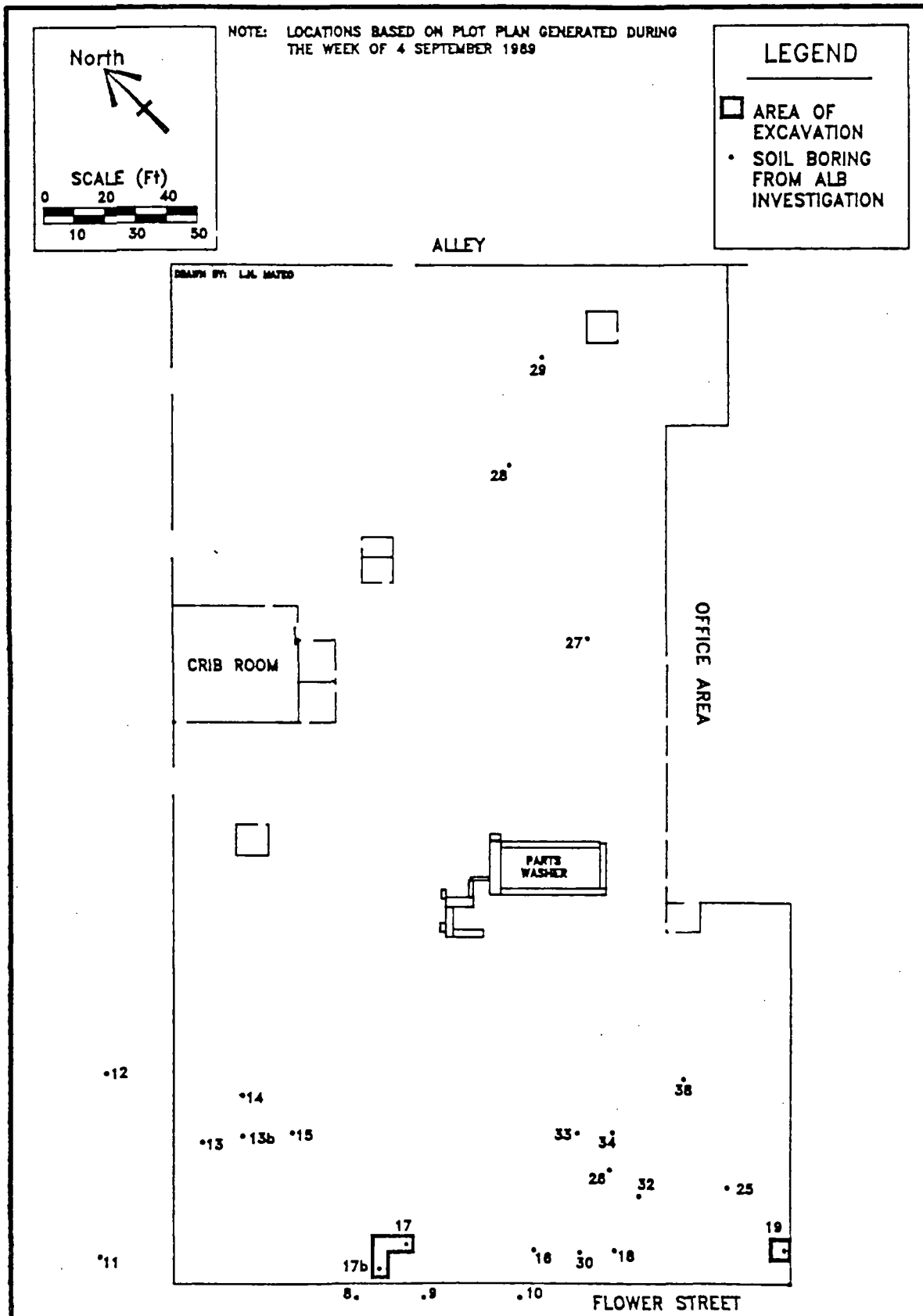
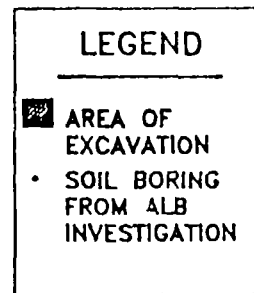
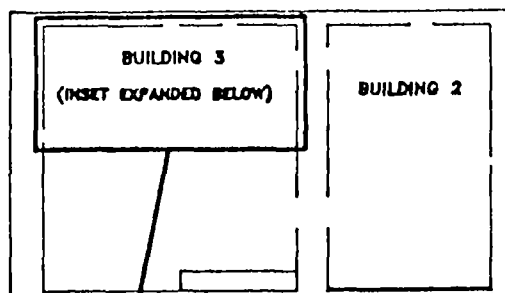
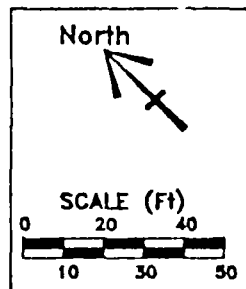


FIGURE 2-1 LOCATION OF PREVIOUS SOIL BORINGS IN BUILDING 2



NOTE: LOCATIONS BASED ON PLOT PLAN GENERATED DURING THE WEEK OF 4 SEPTEMBER 1989

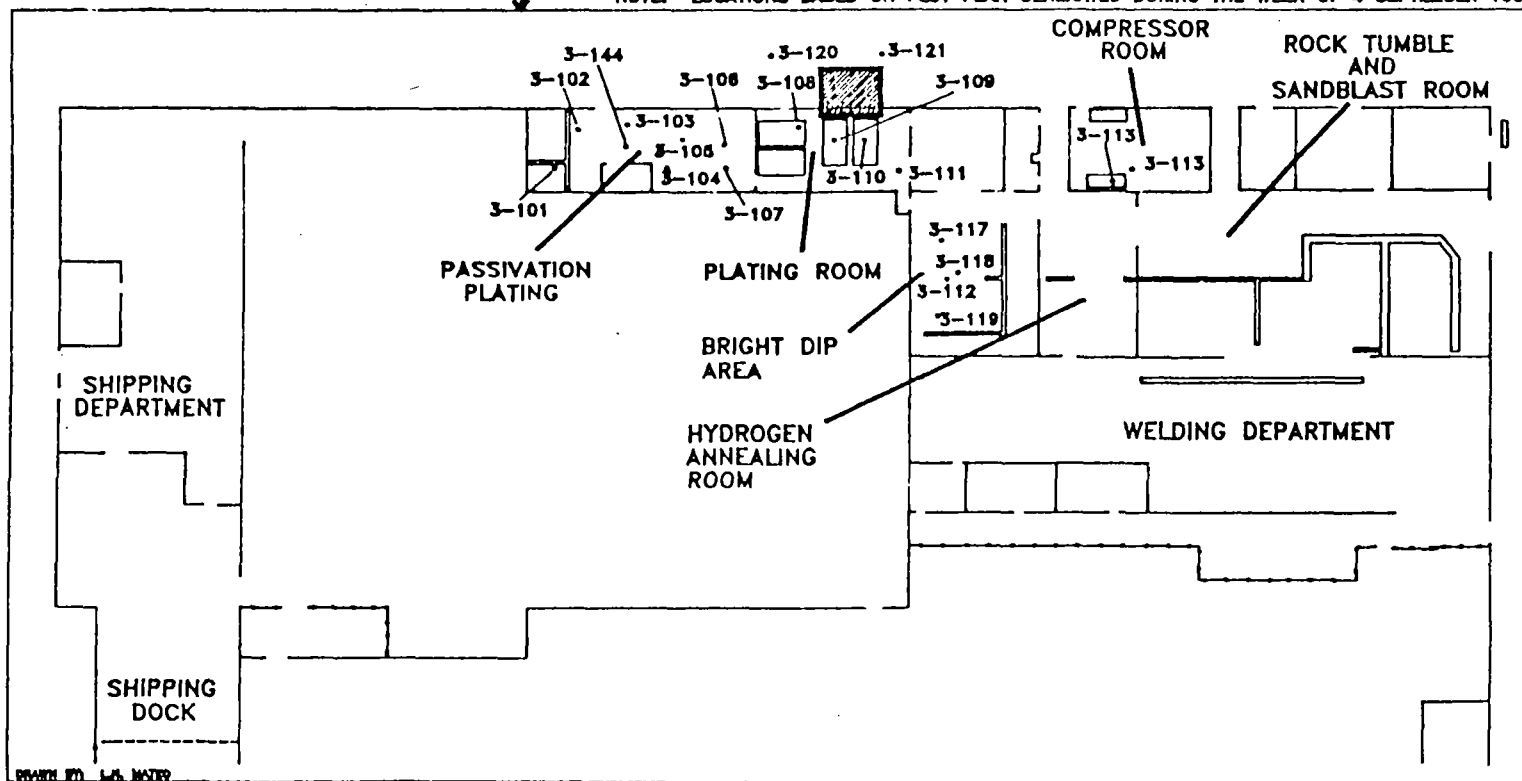


FIGURE 2-2 LOCATION OF PREVIOUS SOIL BORINGS IN BUILDING 3

Cross-sections constructed from the boring logs of the ALB investigations are presented in Section 4 of this report. An assessment of the data collected by ALB is presented in Section 5.2, Database Inventory.

Section 3

SECTION 3

REGIONAL GEOLOGY AND HYDROGEOLOGY

3.1 PHYSIOGRAPHY

The ITT facility is located in the eastern portion of the San Fernando Valley, a roughly elliptically shaped alluvial-filled valley in Southern California (Figure 3-1). Much of the valley fill consists of coalescing alluvial fans originating from the canyons of the bordering mountains.

The valley is surrounded by mountains: on the east and northeast by the San Rafael Hills, Verdugo Mountains, and San Gabriel Mountains; on the north by the San Gabriel Mountains and the eroded south limb of the Little Tujunga Syncline which separates it from the Sylmar Basin; on the northwest and west by the Santa Susana Mountains and Simi Hills; and on the south by the Santa Monica Mountains (California State Water Rights Board, 1962).

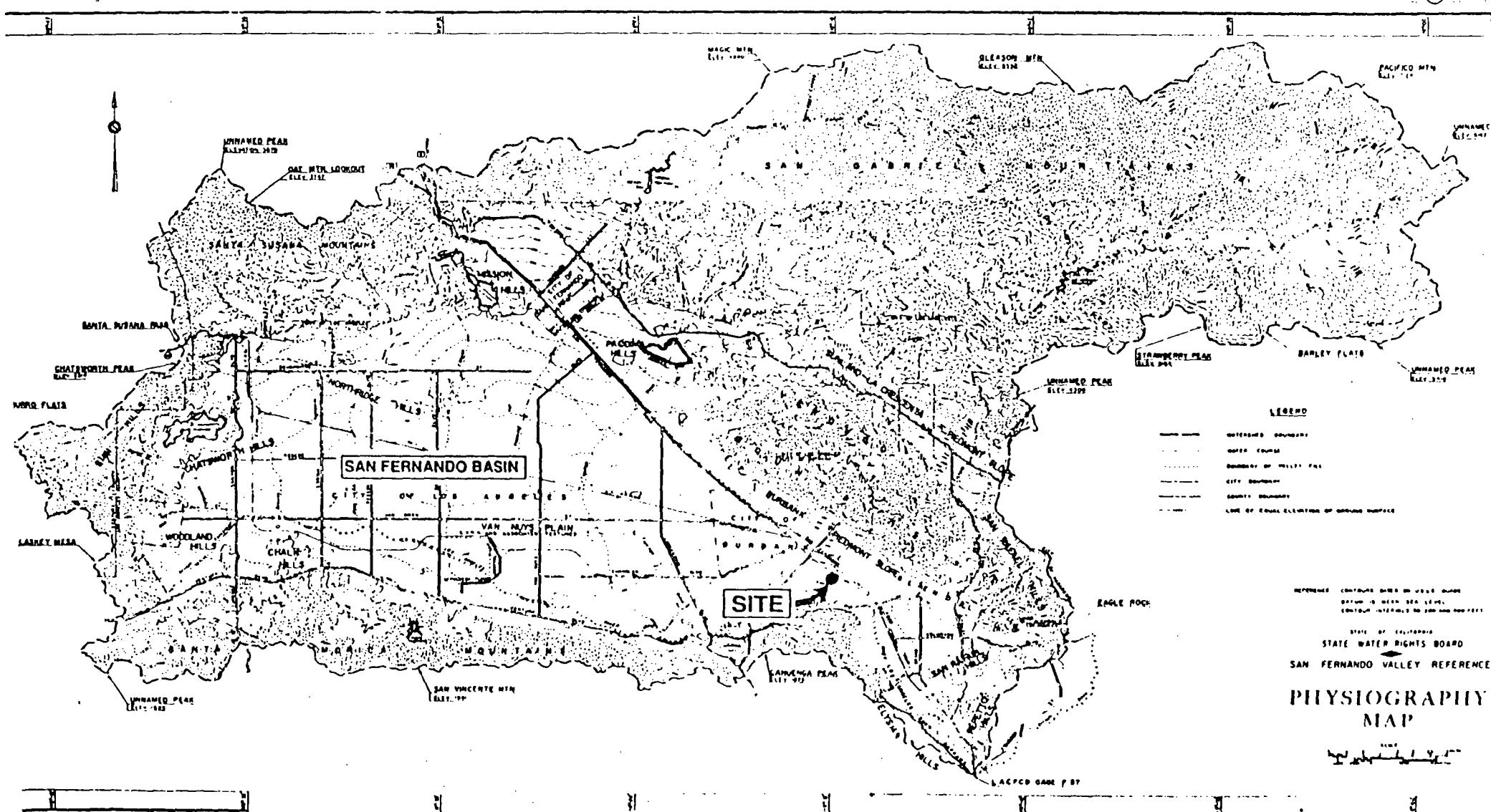
The Los Angeles River is the primary surface drainage through the San Fernando Valley; it flows along the southern side of the valley toward the southeast through the Los Angeles Narrows. The principal tributaries feeding into the drainage network are the streams and washes of the Big Tujunga, Little Tujunga, Pacoima, Aliso, Browns, Bull and Arroyo Calabasas Canyons (California State Water Rights Board, 1962). Many of these drainages are improved and are part of the County and City of Los Angeles Flood Control Projects.

3.2 REGIONAL GEOLOGY

The San Fernando Valley comprises a portion of the northwestern block of the Los Angeles Basin. The basin lies on the southern boundary of the Transverse Range geologic province, which is characterized by east-west trending geological structures.

Structurally, the San Fernando Valley is a large east-west synclinal downwarp. The valley is bounded on the north and northeast by the crystalline-rock, fault-block masses of the San Gabriel Mountains and Verdugo Mountains (Sharp, 1972). To the south lie the anticlinally upwarped Santa Monica Mountains which consist largely of late-middle to early Tertiary, marine sedimentary rocks: Triassic slates and granite rocks are to the east and mid-Tertiary volcanic rocks are to the west (Figure 3-1) (Sharp, 1972).

WESTON



The San Fernando Valley basement rock complex is overlain by thousands of feet of mid-Tertiary marine sediments and volcanics that were deposited during a major tectonic reorganization of western California during the Neogene (Blake and others, 1978).

Plio-Pleistocene tectonic reorganization and flexing of the California Borderland (the offshore geologic province south of the Transverse Range Province) increased subsidence rates. This increased subsidence deepened the major synclinal areas of Los Angeles basins and uplifted the Santa Monica and San Gabriel Mountains, greatly enlarging the source terrain for subsequent valley deposits (Yerkes and others, 1965; Ingle, 1980). As a result, clastic continental deposition began to dominate in the Pleistocene, rapidly filling the synclinal areas in Los Angeles Basin (Yerkes and others, 1965).

More recently, alluvial deposition dominated in the late Pleistocene and has continued into the Holocene. The alluvial deposits of the western portion of the San Fernando Valley contain fine-grained, clayey deposits with minor sands and gravels. This fine-grained material is derived from the Tertiary and pre-Tertiary sedimentary rocks of the Simi Hills, the Santa Monica Mountains, and the Santa Susana Mountains.

The alluvial deposits of the eastern San Fernando Valley, where ITT is located, are comprised of cobbles, gravel, and sand, with silt and clay as minor components. The source areas for this portion of the San Fernando Valley are the granitic and metamorphic rocks of the western San Gabriel Mountains. The alluvium in the eastern portion of the valley was deposited primarily by the Pacoima and the Tujunga Washes. The soils in the immediate vicinity of the site have been designated as "medium infiltration" soils (Figure 3-2) (California State Water Rights Board Referee, 1962). However, most of the soils in the eastern portion of the valley have been designated as "high infiltration" soils.

This geographic distribution of high permeability materials in the eastern portion of the basin has important implications when evaluating the hydrogeology and attendant water production from the different portions of the valley as described below.

3.3 REGIONAL HYDROGEOLOGY

3.3.1 Water-Bearing Units

Generally the water-bearing zones within the San Fernando Valley are found in three units from deep to shallow: the Pleistocene

WEST

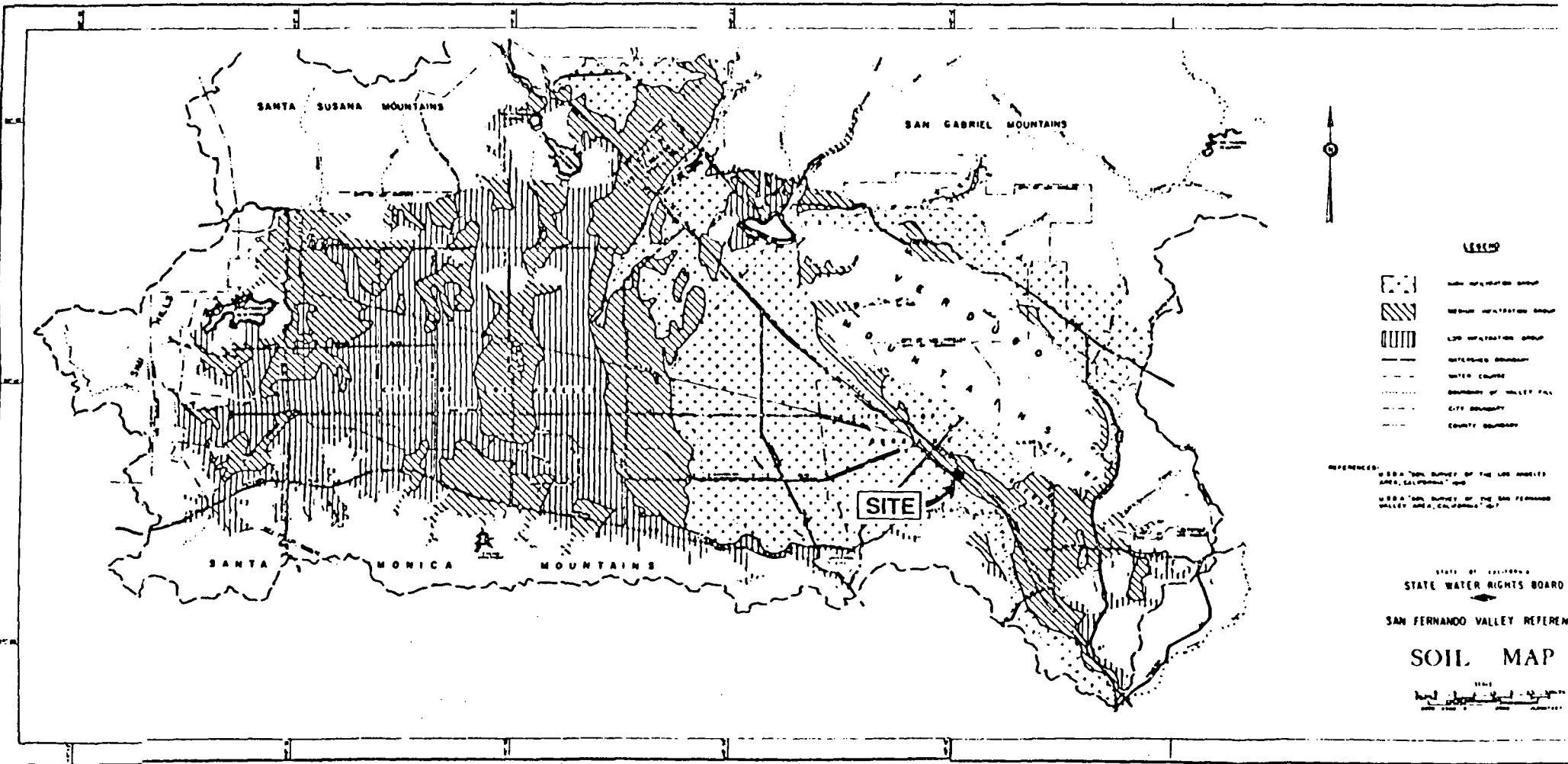


FIGURE 3-2 SOIL MAP OF SAN FERNANDO BASIN INDICATING INFILTRATION RATES OF SOIL, ITT SITE LOCATED IN MEDIUM INFILTRATION GROUP (from CALIFORNIA STATE WATER RIGHTS BOARD, 1962).

Saugus Formation, late Quaternary Older Alluvium (terrace deposits), and Recent Alluvium (California State Water Rights Board, 1962).

The water-bearing portion of the Saugus Formation is comprised of poorly sorted, loosely consolidated conglomerate and coarse sandstone that were the result of fluvial and alluvial fan deposition. Intermittent layers and lenses of clayey gravel are present due to in-place weathering of the original materials. Generally, the Saugus Formation has lower permeability than the alluvial deposits (California State Water Rights Board, 1962). The Saugus Formation is restricted to the northern portion of the basin.

The Older Alluvium (terrace deposits) and the Recent Alluvium consist of similar material to the Saugus Formation, but vary areally depending on the source terrain. The sediments are generally very poorly sorted, angular to subangular, and poorly consolidated. Additionally, in the Older Alluvium are locally cemented deposits and areas of residual clays that are the result of weathering.

Numerous layers of ancient soil horizons are found within the Older Alluvium, which indicate depositional hiatus and periods of extensive weathering. Depositional patterns of the Older Alluvium indicate a similar drainage pattern to the existing drainage in the basin. However, stream valleys were probably broader and had slightly lower gradients, which resulted in finer-grained deposits than the Recent Alluvium, which are coarser due to greater stream gradients and uplifted source terrains.

3.3.2 Geographic Distribution of Water-Bearing Zones

As previously stated, the character of the alluvial material in the San Fernando Basin is dependent on the source terrain. The eastern part of the basin is comprised of detritus from the crystalline rocks that resulted in the very thick accumulations of boulders, gravels, and sands that become finer grained as the distance increases from the canyon mouths. In contrast to well logs in the western portion, the eastern portion well logs exhibit more permeable materials and have an average of 20 percent clay, 35 percent sand, and 45 percent gravel (California State Water Rights Board, 1962).

The deposits within the western portion of the valley have been derived from predominantly sedimentary rocks and are finer-grained than eastern valley sediments. Well logs from this area indicate an average of 75 percent clay, 5 percent sand, and 20 percent gravel (California State Water Rights Board, 1962). These deposits in the western portion of the Basin generally produce significantly

less water of poorer quality than those sediments in the eastern portion of the basin.

As a result, the textural differences of these water-bearing materials have greatly affected the distribution of ground water in the basin. The coarse sands and gravels of the eastern part of the San Fernando Valley constitute approximately one-third of the surface area of the ground-water reservoir; however the same area holds approximately two-thirds of the ground-water storage capacity. Due to the very permeable character of these deposits, the majority of the City of Los Angeles wells are located in this region (California State Water Rights Board, 1962).

The ITT site is underlain by sands, gravels, silts, and clays, with sands predominating within the stratigraphic column. Based on regional data, the general direction of ground-water flow is southeast towards pumping depressions created by Crystal Springs and the City of Glendale well fields, and towards the Los Angeles River Narrows at the east end of the Santa Monica Mountains.

Section 4

SECTION 4

SITE GEOLOGY AND HYDROGEOLOGY

The geological and hydrogeological interpretations that are presented in this section were gleaned from available site-specific data described in Section 2. Numerous soil borings were drilled and sampled at the ITT facility; the logs of some of these borings are presented in Appendix A. The data from these boreholes illustrate the heterogeneous lithology and hydraulic character of the vadose zone, and indicate the possible presence of perched groundwater. Few borings penetrated to groundwater, so interpretation of the hydrogeology of the saturated zone is limited at this time.

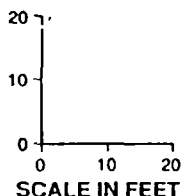
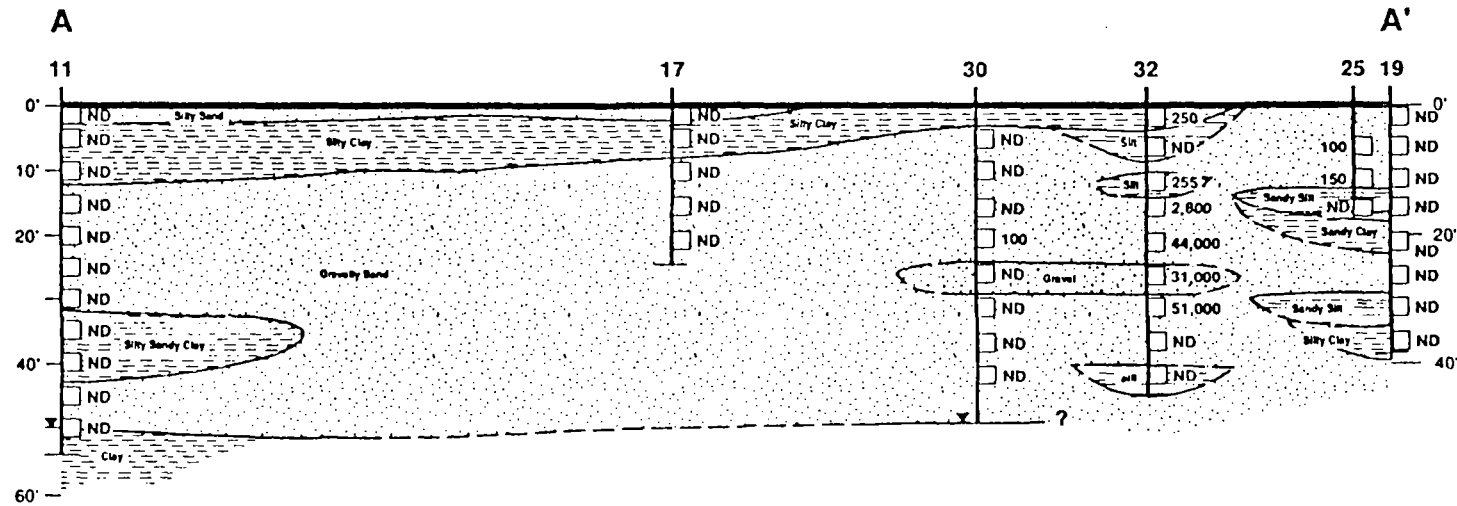
4.1 SITE GEOLOGY

In order to examine the lithology beneath Buildings 2 and 3, four geologic cross-sections were constructed (Figures 4-1, 4-2, 4-3, and 4-4). The locations of these cross-sections are shown on Figure 4-5. As few borings encountered water, these figures were used predominantly to evaluate the stratigraphy and the hydraulic character of the vadose zone, and also were used to compare chemical concentration trends with depth and lithology (Section 5.0).

A review of the available lithologic data indicates a complex and heterogeneous vadose zone. An inspection of the cross-sections shown in Figures 4-1 through 4-4 show that the lithology of the vadose zone beneath Buildings 2 and 3 is characterized by interfingering clays, silts, sands, and gravels. In Figure 4-1, the northwest-southeast cross section through Building 2, sands predominate, with some interfingering silts and clays. Figure 4-3, the cross-section through the plating passivation area, shows alternating layers of fine-grained and coarse-grained strata. Figure 4-4, the cross section through the Bright Dip Sump area, also indicates interfingering of silts, clays, and sands. Additionally, borings from the HLA study encountered mostly sands to approximately 45 feet below ground surface in the vicinity of Building 16, then encountered a clay layer about 5 feet thick in the one boring that was drilled beyond 45 feet below ground surface. Because the HLA borings were not drilled in the vicinity of Buildings 1, 2 and 3, these borings are not included in the cross-sections. Rather, they are discussed in order to give an indication of the heterogeneous nature of the subsurface materials at the site.

Northwest

Southeast



LEGEND:

- Boring
- Depth at which water was encountered during drilling
- Lithologic Contact (dashed where inferred)
- Interval Sampled
- 150 Total Volatile Organic Compounds (µg/kg)
(Trichloroethylene, Trichloroethane, 1,1,1-Trichloroethane, 1,1-Dichloroethane, 1,2-Dichloroethane, Chloroform, Ethylbenzene, Carbon Tetrachloride, Toluene, Acetone, 2-Butanone, Total Xylenes)
- ND = Not Detected (VOCs)
- NA = Laboratory Report Not Available

Southwest

Northeast

B

B'

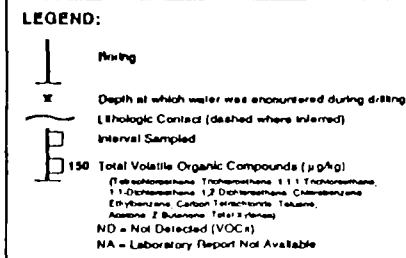
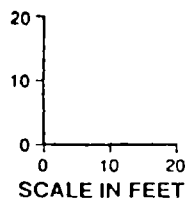
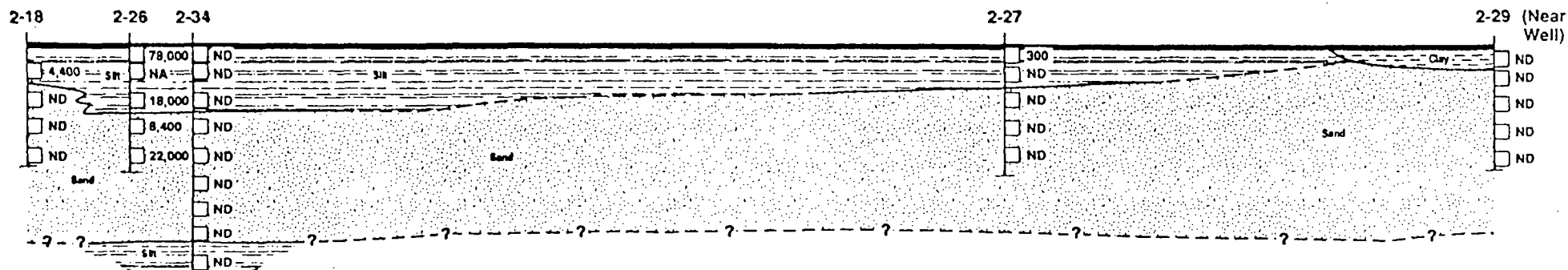


FIGURE 4-2 GEOLOGIC CROSS-SECTION

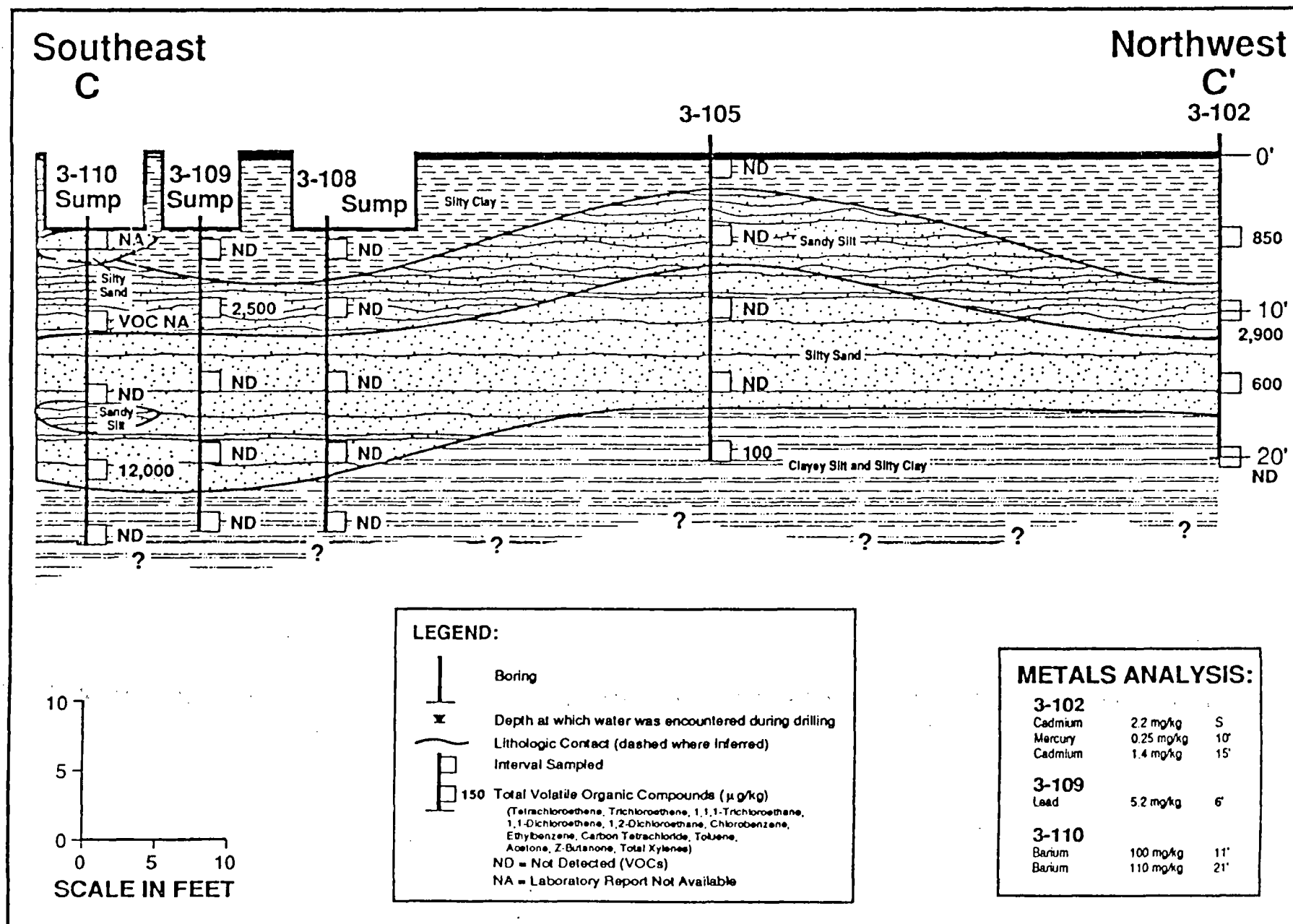


FIGURE 4-3 GEOLOGIC CROSS-SECTION C-C', BUILDING 3

Northeast

Southwest

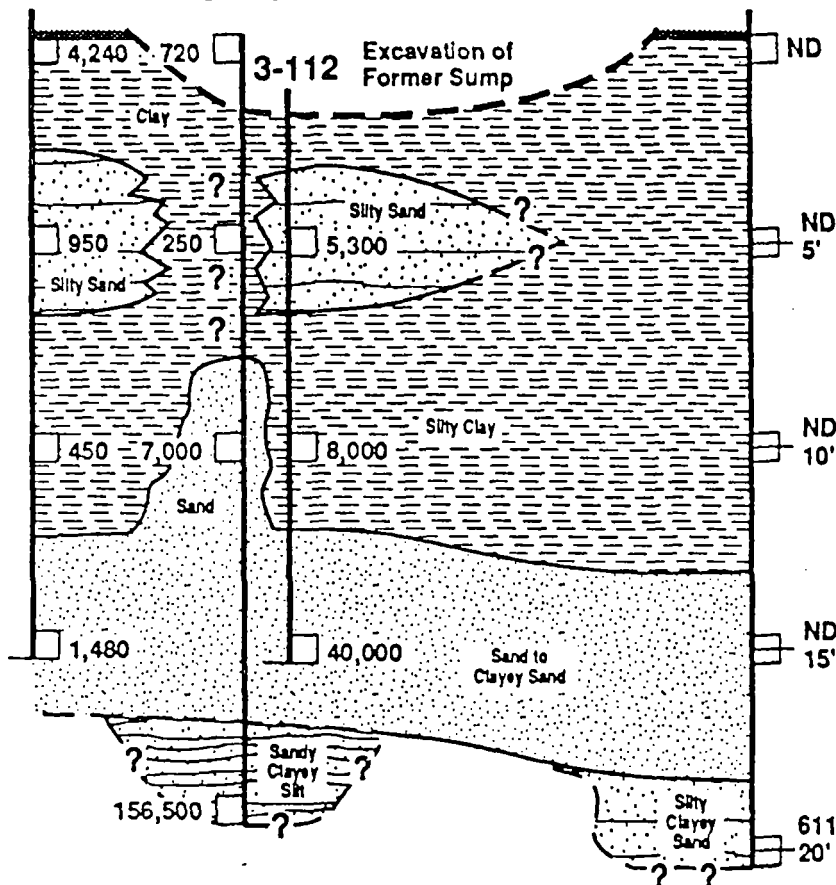
D

D'

3-117

3-118

3-119



METALS ANALYSIS:

3-112

Barium	110 mg/kg	5'
Lead	260 mg/kg	5'
Chromium (Hex)	6.18 mg/kg	10'
Copper	35 mg/kg	10'
Lead	140 mg/kg	10'
Chromium (Hex)	16.8 mg/kg	15'
Copper	90 mg/kg	15'
Lead	110 mg/kg	15'
Mercury	0.23 mg/kg	15'
pH	4.10	15'

3-117

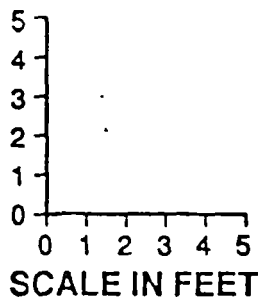
Copper	69 mg/kg	1'
Lead	180 mg/kg	1'
Barium	110 mg/kg	5'
Lead	27 mg/kg	5'
Mercury	1.5 mg/kg	5'
Copper	29 mg/kg	10'
Lead	170 mg/kg	10'
Mercury	1.4 mg/kg	10'
Copper	82 mg/kg	15'
Lead	78 mg/kg	15'
Mercury	1.0 mg/kg	15'

3-118

Lead	35 mg/kg	1'
Lead	28 mg/kg	5'
Lead	82 mg/kg	10'
Cadmium	5.7 mg/kg	20'
Lead	5.5 mg/kg	20'

3-119

Chromium	1400 mg/kg	1'
Chromium (Hex)	145 mg/kg	1'
Copper	51 mg/kg	1'
Chromium	610 mg/kg	5'
Chromium (Hex)	79 mg/kg	5'
Lead	7.2 mg/kg	10'
Chromium (Hex)	53 mg/kg	15'
Lead	15 mg/kg	20'



LEGEND:

- Boring
- Depth at which water was encountered during drilling
- Lithologic Contact (dashed where inferred)
- Interval Sampled
- 150 Total Volatile Organic Compounds (µg/kg)
(Tetrachloroethene, Trichloroethene, 1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2-Dichloroethane, Chlorobenzene, Ethylbenzene, Carbon Tetrachloride, Toluene, Acetone, Z-Butanone, Total Xylenes)
- ND = Not Detected (VOCs)
- NA = Laboratory Report Not Available

Note: 3-118 is ten feet from D-D' transect: "?" denotes Lithologic uncertainty

FIGURE 4-4 GEOLOGIC CROSS-SECTION D-D', BRIGHT DIP SUMP, BUILDING 3

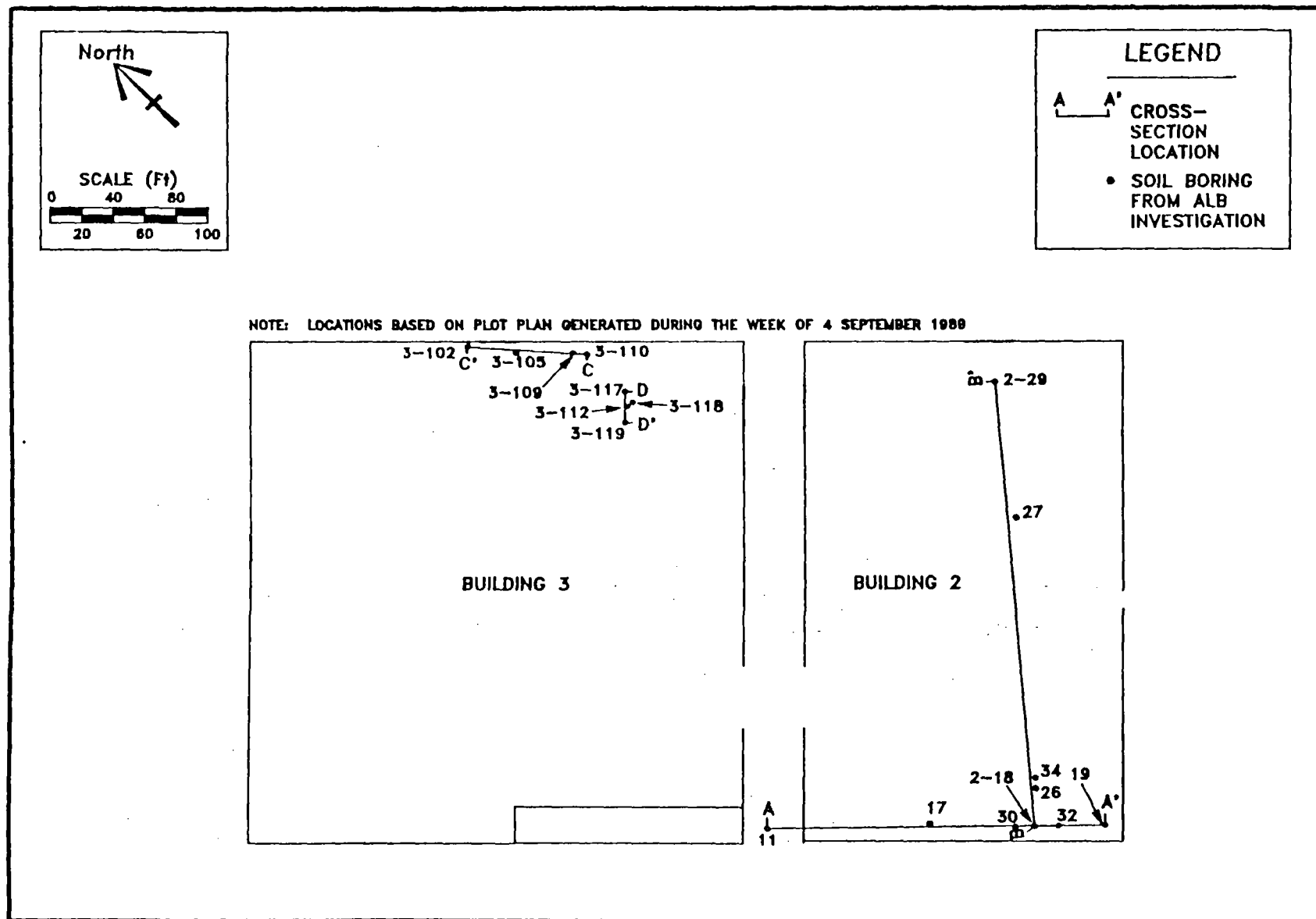


FIGURE 4-5 LOCATIONS OF GEOLOGIC CROSS-SECTION

The stratigraphy of the site suggests an alluvial depositional environment. Alluvial depositional environments are characterized by sands and gravels deposited in channels that are elongated in the direction of stream flow and are commonly enclosed in finer-grained silts and clays (overbank deposits). Alluvial sediments also are characterized by significant lateral lithologic discontinuities, which appear to be prevalent at the ITT site.

4.2 SITE HYDROGEOLOGY

Perched water is common in complex heterogeneous geological environments. Within the vadose zone, the existence of a low-permeability clay layer in a high-permeability sand formation can lead to the formation of a saturated zone of limited areal extent, called perched water, with unsaturated conditions existing both above and below the perched water.

Based on previous boring logs, perched water was encountered in a number of borings at the site at depths ranging from 38 to 50 feet. Water was encountered at 38 feet below ground surface in Boring 2, along the Southern Pacific Railroad Mainline north of the site. In the vicinity of Building 2, water was encountered at 50 feet below ground surface in Boring 11, at 45 feet below ground surface in Boring 12, and at 47 feet below ground surface in Boring 30. Based on boring logs, no water was encountered in the borings drilled by HLA to depths of 45 feet to 50 feet in the vicinity of Building 16. Water was encountered at 38 feet below ground surface in Boring 1 drilled by Leroy Crandall and Associates in the vicinity of Building 6. Because water is encountered in some borings, but is not encountered in adjacent borings, this water is considered to be perched and of limited areal extent.

As stated earlier, a water well, thought to be more than 30 years old, is located in Building 2. It is no longer in use. Prior to the late 1950's, the water from this well was used for wash water outside of Building 2. As records are not available, the total depth of the well is unknown, and the well presently appears to be silted up to a depth of approximately 31 feet below ground surface. Site personnel recollect that, in the past, the depth to water was approximately 80 feet below ground surface (ITT, personal communication).

Additional information on local hydrogeology is available in reports submitted to the Los Angeles Regional Water Quality Control Board (LARWQCB) by Interstate Brands Corporation (IBC), 6841 San Fernando Road, Glendale, California. Interstate Brands is located to the northeast of the ITT facility, just across the Southern Pacific Railroad Mainline. Monitoring wells have been installed

at that site to investigate historic releases of diesel fuel and motor oil. One monitoring well, in which free product thickness was measured as 0.16 feet, is located south of the Southern Pacific Railroad Mainline, directly adjacent to the ITT site.

Geologic conditions at the IBC site are similar to those encountered at the ITT site. Ground water is encountered at approximately 50 feet below ground surface on the IBC site, with a westerly ground-water gradient of 0.012 ft/ft. However, chemical concentrations indicate flow is or has historically been opposite to the present apparent flow direction. The ground-water gradient in this area is believed to be affected by pumping of municipal wells at the Headworks and City of Glendale (Grandview), and the Crystal Springs well fields. The Headworks wells are located approximately 1.25 miles southwest of the ITT site. The Grandview wells and the Crystal Springs wells are located approximately 1.25 miles and 1.6 miles southeast of the ITT site, respectively.

Section 5

SECTION 5

SOILS INTERPRETATION

The soils interpretation for the area of Buildings 2 and 3 is based on data compiled by A.L. Burke Engineers in 1988 and 1989. No additional field work in this area has been performed to date. The investigations in and around Buildings 2 and 3 were performed because of historical uses of those buildings.

As stated in Section 1, the primary operation conducted in Building 2 was the machining of parts. A parts washer was located in the central portion of the building, where some parts were pre-rinsed with solvents. The washer used detergent (Oakite) and water for degreasing. Two degreasers that used solvents were located in the western portion of the building. A TCE still was also located in this area.

Also stated in Section 1, the majority of the area in Building 3 has been used recently for warehousing, primarily in the south-western portion. Some assembly of parts was done in the area prior to warehousing. The processing area located on the eastern end of the building was added before 1957. Segregated areas were assigned to various steps of the plating and anodizing process and included:

- Rock Tumble and Sandblast Room.
- Hydrogen Annealing Room.
- Bright Dip Room.
- Plating Room.
- Plating Passivation Area.
- Painting Booths.

Numerous trenches drained the areas, and the flow went to the two large clarifier sumps in the Plating Room. The resulting wastewater would flow to a sampling port for the sanitation district and then to the sanitary sewer system. A compressor room was located in the area. The former location of the sulfuric and muriatic acid tanks is outside of the Plating Room. A waste oil storage room is located in the east corner of the building. This room contained aboveground tanks and a sump.

5.1 WORK TO DATE

As stated earlier, numerous borings have been drilled in and around Buildings 2 and 3. Twenty-two soil borings, from which samples were collected, were drilled in and around Building 3; these borings were not drilled beyond a depth of approximately 20 feet. Twenty-four soil borings, from which samples were collected, were drilled in and around Building 2; the maximum depth drilled in this

area was 47 feet. Additional borings were drilled across the property in areas other than Buildings 2 and 3, for a total of approximately 53 borings at the site. Surficial soil samples and other materials (concrete, oil, sludge) also were collected and analyzed. Only the subsurface soils results are discussed here.

5.2 DATABASE INVENTORY

A database inventory was performed on all samples (soil, concrete, water, oil, sludge) collected by A.L. Burke Engineers. The database inventory consisted of a quality review for consistency of tabulated results, chain-of-custody forms, laboratory reports, and boring logs. The following information was collected for each sample: (1) sample identification, (2) collection date, (3) date of analysis, (4) if holding times were met, (5) what analytical method was actually performed by the laboratory, (7) whether a Waste Extraction Test (WET) was performed or not, (8) what compounds were detected, and (9) any additional comments. The completed database inventory is presented in Appendix B.

Based on a review of available information on the samples and the resulting analytical data, the chemical data collected during the investigations can be used as screening-level data to 1) develop an initial conceptual model of the site, and 2) evaluate whether further work is needed at the site. The reasons to use the data for screening-level purposes for the above objectives are as follows:

- 1) Confirmatory analyses using gas chromatography/mass spectrometry (GC/MS) or second column confirmation rarely were performed.
- 2) Neither a Sampling and Analysis Plan nor a Quality Assurance/Quality Control Plan was developed or used.
- 3) Field sampling protocols were not documented consistently.
- 4) Holding times were not met for some samples.
- 5) Sixteen samples were delivered to the laboratory more than one month after the date of collection. This batch included samples for volatiles analysis.

5.3 CORRELATION OF STRATIGRAPHY AND CHEMICAL CONCENTRATION

In order to assess any potential correlation between chemical concentration and lithology at this site, analytical results for soil samples for the borings used to develop the four geologic cross-sections presented in Section 4 were compared with the lithology of the sample.

TOTAL Depth bored
in this area was
47 feet

5.3.1 VOCs in Soils

Chemical concentrations and lithology are illustrated in Figures 4-1, 4-2, 4-3, and 4-4. Based on available data, there was no evidence for correlation between VOC concentrations and lithology for the site. As shown on Figure 4-4, for example, VOCs were detected in all samples collected from boring 3-117, in both clays and sands, without any apparent preference or consistent trend in concentration.

Total VOC concentrations vary with depth, with no consistent trends apparent between borings. Total VOCs in Boring 3-117 were as follows: 4,240 ug/kg in the surficial sample (clay), 950 ug/kg in the 5 foot depth sample (sand), 450 ug/kg in the 10 foot depth sample (clay), and 1,480 ug/kg in the 15 foot sample (sand). In both borings 3-112 and 3-118, VOCs increase with depth, again without any apparent lithologic preference. Total VOCs in boring 3-112 were as follows: 5,300 ug/kg in the 5-foot depth sample (sand), 8,000 ug/kg in the 10-foot depth sample (clay), and 40,000 ug/kg in the 15-foot depth sample (clay). Total VOCs in boring 3-118 were as follows: 720 ug/kg in the surficial sample (clay), 250 ug/kg in the 5-foot depth sample (clay), 7,000 ug/kg in the 10-foot depth sample (sand), and 156,500 ug/kg in the 20-foot depth sample (silt).

5.3.2 Metals in Soils

Analyses for California Assessment Manual (CAM) metals were performed on a majority of samples collected in and around Building 3. The results were compared to state regulatory standards for hazardous waste classification know as the Total Threshold Limit Concentration (TTLC) and Soluble Threshold Limit Concentration (STLC). These standards are set forth in the California Code of Regulations, Title 22, Section 66699. The TTLC is the total concentration of a substance in soils or solid material. The STLC is the concentration of the solubilized or extractable portion of the substance that results from the Waste Extraction Test (WET) specified in the California Code of Regulations, Title 22, Section 66700. TTLCs and STLCs are used to develop the appropriate designation for the soil or solid material. The STLCs and the TTLCs for CAM metals are listed in Table 5-1.

Based on available data, the TTLC was exceeded for only one metal (chromium) in samples from only one boring, boring 3-104. The results for that boring are as follows: total chromium was detected at 4,600 mg/kg in the surficial sample; total chromium was detected at 3,200 mg/kg in the 5-foot depth sample; total chromium was detected at 3,900 mg/kg in the 10-foot depth sample; and hexavalent chromium was detected at 675 mg/kg in the 15-foot

TABLE 5-1

STLCs AND TTLCs FOR CAM METALS

<u>Parameters</u>	California Code of Regulations Standard	
	<u>STLC, in mg/l</u>	<u>TTLC, in mg/kg</u>
Antimony, Total	15.	500.
Arsenic, Total	5.	500.
Barium, Total	100.	10,000.
Beryllium, Total	0.75	75.
Cadmium, Total	1.	100.
Chromium and/or Chromium III Compounds	560.	2,500.
Chromium, Hexavalent	5.	500.
Cobalt, Total	80.	8,000.
Copper, Total	25.	2,500.
Lead, Total	5.	1,000.
Mercury, Total	0.2	20.
Molybdenum, Total	350.	3,500.
Nickel, Total	20.	2,000.
Selenium, Total	1.	100.
Silver, Total	5.	500.
Thallium, Total	7.	700.
Vanadium, Total	24.	2,400.
Zinc, Total	250.	5,000.

From California Code of Regulations, Title 22, Chapter 30,
Article II (January 12, 1985).

depth sample. The TTLC for total chromium and/or trivalent chromium is 2,500 mg/kg, and the TTLC for hexavalent chromium is 500 mg/kg.

The WET was performed on some samples. However, no rationale for performance of the WET on these samples was given.

In general at the site, levels of metals are highest in surficial samples, and metals concentrations decrease substantially with depth (e.g., borings 3-112 and 3-119). For example, lead decreases from 260 mg/kg at 5 feet, to 140 mg/kg at 10 feet, to 110 mg/kg at 15 feet in boring 3-112. In boring 3-119, chromium decreases with depth at each 5-foot interval, from 1,400 mg/kg in the 1-foot sample to 110 mg/kg in the 20-foot sample.

This trend is also true for metals concentrations in borings not included in the cross-sections, such as boring 3-104. In the samples collected from that boring, chromium decreases from 4,600 mg/kg in the surficial sample to 34 mg/kg in the sample collected from 20 feet below the ground surface.

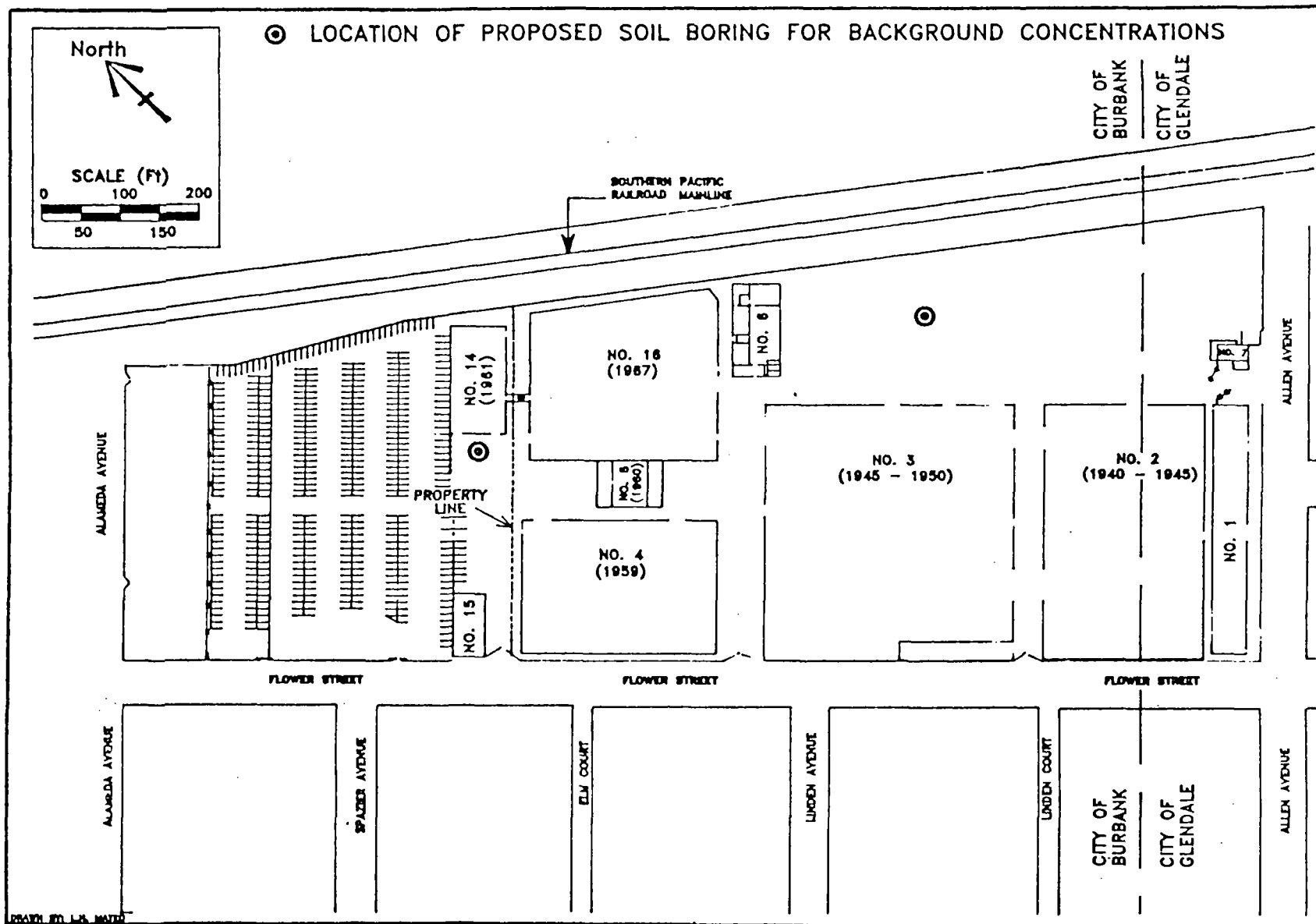
There are exceptions in which metals concentrations do not decrease substantially with depth, such as boring 3-117 (Figure 4-4). In that boring, metals concentrations vary, but are present in concentrations well below their TTLC. Lead was detected at 180 mg/kg in the 1-foot depth sample, at 27 mg/kg in the 5-foot depth sample, at 170 mg/kg in the 10-foot depth sample, and 78 mg/kg in the 15-foot depth sample. The TTLC for lead is 1,000 mg/kg.

Based on the available data, it appears that soils containing levels of metals that may require treatment may be of limited extent both horizontally and vertically. However, this extent must be more fully defined and the concentrations with depth more fully understood by drilling additional borings before any definitive statements can be made. These borings will be proposed as part of the subsequent Phase B described in Section 6.

5.4 RECOMMENDED SAMPLING LOCATIONS FOR BACKGROUND SOIL SAMPLES

It is important to collect background soil samples in an investigation such as this to assess naturally occurring concentrations of metals, so that levels above background can be understood and evaluated. Trace elements occur naturally in soils as a result of the geochemistry of source materials, weathering, and leaching. Therefore, naturally occurring levels vary from region to region. Since background was not clearly defined in previous investigations, background soil samples at depth from two locations at the site are proposed to be collected (Figure 5-1).

*Background
information
should be specific
to the area*



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FIGURE 5-1 PROPOSED LOCATIONS FOR COLLECTION OF BACKGROUND SOIL SAMPLES

A compilation of ranges of metals in natural soils is given in Table 5-2. A comparison of levels of metals in soil samples from borings in Building 3 and levels of metals in naturally occurring soils indicates that the only CAM metal that exceeds natural ranges is chromium. Both EPA (1983) and Shacklette and Boerngen (1984) give a range of 1 mg/kg to 1,000 mg/kg of chromium in natural soils. In boring 3-104, chromium was detected at 4,600 mg/kg in the surficial sample, 3,200 mg/kg in the 5-foot depth sample, 3,900 mg/kg in the 10-foot depth sample, 1,200 mg/kg in the 15-foot sample, and 34 mg/kg in the 20-foot depth sample. In boring 3-119, chromium was detected at 1,400 mg/kg, and below 1,000 mg/kg in the four other samples from that boring. Chromium was not detected above 1,000 mg/kg in any other boring samples from Building 3.

Table 5-2

RANGE OF METALS IN NATURAL SOILS

Metal	Shacklette and Boerngen (1984)			Fuller (1977)		EPA (1983)	
	Mean*	Standard Deviation	Range*	Mean*	Range*	Mean*	Range*
Aluminium	3.3	2.87	0.7->10			7.1	1-30
Antimony	0.52	2.38	<1-8.8				2-10
Arsenic	4.8	2.56	<0.1-73			5	1-50
Barium	290	2.35	10-1500			430	100-3000
Beryllium	0.55	2.53	<1-7			6	0.1-40
Boron	31	1.88	<20-150			10	2-100
Cadmium				0.06	0.01-7	0.06	0.01-.7
Calcium	0.34	3.08	0.01-28				
Chromium	33	2.60	1-1000			100	1-1000
Cobalt	5.9	2.57	<0.3-70	8.	1-40	8	1-40
Copper	13	2.80	<1-700	20	2-100	30	2-100
Iron	1.4	2.87	0.01->10				
Lead	14	1.95	<10-300	10	2-200	10	2-200
Magnetite	0.21	3.55	0.005-5			0.5	0.06-.6
Manganese	260	3.82	<2-7000	850	100-4000	600	20-3000
Mercury	0.081	2.52	0.01-3.4			0.03	0.01-0.3
Molybdenum	0.32	3.93	<3-15			2	0.2-5
Nickel	11	2.64	<5-700	40	10-1000	40	5-500
Potassium	1.2	0.75	0.005-3.7				
Selenium	0.30	2.44	<0.1-3.9			0.3	0.1-2
Silicon	34	6.64	1.7-45				
Silver						0.05	0.015
Sodium	0.25	4.55	0.05-5				
Vanadium	43	2.51	<7-30			100	20-500
Zinc	40	2.11	<5-2900		10-300	50	10-300

* All units are in mg/kg

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Section 6



SECTION 6

ACTION PLAN

The comprehensive action plan that is outlined here is designed to achieve ITT's overall goals. The objectives of this action plan are: 1) to fill in data gaps identified from previous investigations so that site characterization is complete, 2) to assess the extent of constituents of concern, and 3) to develop a regulatory strategy for closure. This plan is flexible to address the full range of technical and regulatory options judged feasible for the site consistent with ITT's overall goals. The action plan is broken down into additional investigation needs and regulatory closure options. These stages of the Action Plan are described in detail in the following sections.

6.1 ADDITIONAL INVESTIGATION

Previous soils investigations, described in Sections 2.0 and 5.0 of this report, have been performed at the ITT site in Glendale/Burbank. The results of those investigations do not provide sufficient information to complete subsurface characterization of the site. Additional investigations are proposed as part of the next phase (Phase B) to complete the site characterization. Soil-gas screening, additional soil borings, and surface geophysics are discussed here as options within the Action Plan to complete the subsurface investigation at Buildings 2 and 3.

Two types of confirmatory soil borings are recommended: 1) those that examine the distribution of metals concentrations and 2) those that confirm VOC concentrations with depth. The recommended course of action for the soil borings will proceed as follows:

- 1) Soil-gas screening will be performed to identify areas within and around Buildings 2 and 3 that contain elevated levels of VOCs in the soil gas. These areas then will be targeted for confirmatory soil borings that will be drilled and sampled to the water table, taking care to observe and document the clayey silty sediments observed at depths of 45 to 50 feet at the site.
- 2) Since soil-gas screening will identify areas of VOCs but not metals, the additional borings for metals confirmation will be located based on past sampling results, history of usage at the site, processes that incorporated their usage, and interviews with site personnel. These borings will be located only after the results of the soil-gas screening are obtained, so that economies can be achieved by combining both sets of analytes (VOCs and metals) for the same borehole, if possible.

Should information obtained during this initial part of Phase B indicate that surface geophysics be performed in some areas, then the appropriate technique will be recommended. Almost certainly magnetometry will be used to clear soil boring locations before drilling.

These techniques and their applications for the site are described briefly below and in detail in the Sampling and Analysis Plan presented in Appendix E.

6.1.1 Soil-Gas Screening

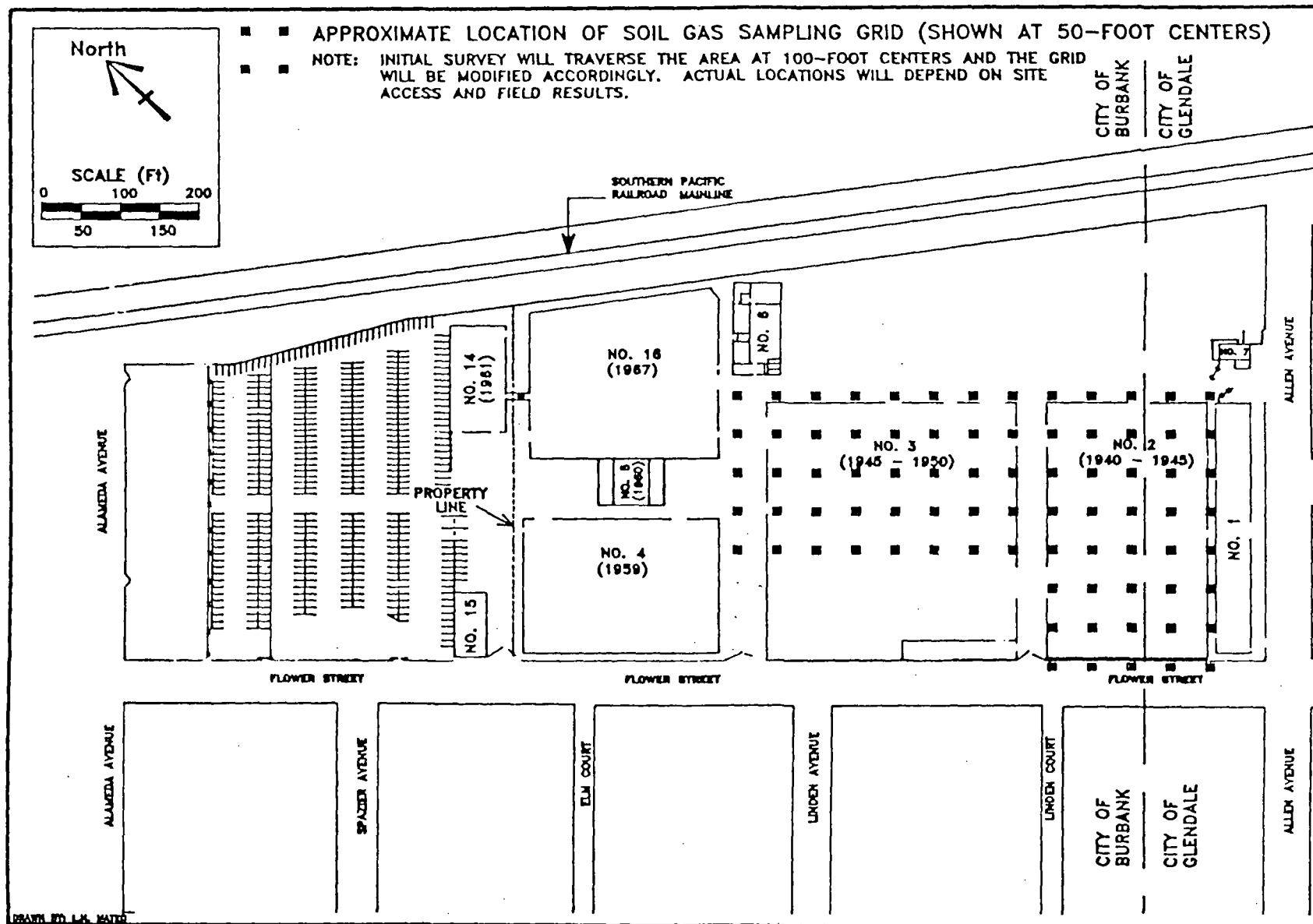
We propose the use of soil-gas screening to assess the horizontal extent of the volatile organic compounds (VOCs) in soils in the areas shown on Figure 6-1. Soil-gas screening may identify areas of elevated VOC concentrations not found during previously performed investigations, and thereby identify optimal locations for subsequent soil borings to complete the characterization of the lateral and vertical extent of VOCs in soils. The soil-gas survey will be completed prior to other additional investigative work, and will be used as a basis to guide further work to characterize the site.

Based on WESTON's experience with soil-gas screening at similar sites, the technique works well for source area identification. Source area concentrations of soil gas typically range in the 100's to 1000's mg/l, while background concentrations are usually in the low ug/l range. It is important to note that although soil-gas screening is an effective tool to locate possible source areas, concentrations of soil gas do not quantitatively correspond to actual soil concentrations. It is therefore important to confirm identified areas of elevated VOC concentrations with soil sampling and analysis to assess actual chemical concentrations in soils for regulatory purposes. The soil-gas technique is a cost-effective method for identifying possible sources and reduces the subsequent number of confirmatory soil borings.

The actual number of soil-gas probes required at the site will depend on the field conditions encountered and the real-time data obtained in the field. The soil-gas screening methodology is described in Appendix E, the Sampling and Analysis Plan.

6.1.2 Soil Borings and Soil Sampling

A specific work plan specifying the number of borings, their locations, sampling intervals, specific analyses and the rationale for these will be prepared after analyzing the soil-gas results and locating the borings for metals analyses.



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FIGURE 6-1 PROPOSED AREAS FOR SOIL-GAS SCREENING

2 / sample
at first cut

In general though, soil borings will be drilled and sampled for chemical analyses at five-foot intervals from the ground surface to the base of vadose zone in areas identified as a result of the soil-gas survey and the subsequent locations for metals as described above. The soil samples will be assessed in order to characterize the entire vadose zone.

Samples will be collected in accordance with the Sampling and Analysis Plan (Appendix E), and will be analyzed by EPA Method 8240 or EPA Method 8010/8020, and for the CAM metals as appropriate. Any additional soil samples needed to provide the necessary data for selection of remedial alternatives such as in situ vacuum extraction will be collected at this time. In addition, some borings will be logged at 2.5-foot intervals or continuously to better characterize the vadose zone at approximately 45 feet below ground surface where a clayey silty layer has been identified. Also, background soil samples will be collected as described in Section 5.4.

Additionally, as noted in Section 5.0, soil samples were not collected at depths greater than 20 feet at Building 3 during the previous investigations while other borings across the site have reached depths of up to 50 feet. While depth to regionally continuous ground water is unknown at this site, possible perched water has been encountered at 38 feet and 50 feet in previous soil borings.

Elevated levels of VOCs were detected in some borings at a depth of 20 feet. For example, tetrachloroethene was detected at 120,000 ug/kg at 20 feet in Boring 3-118 in the Bright Dip Sump area. Therefore, in those areas of Building 3 where elevated levels of VOCs were detected at depths of 15 and 20 feet, we also propose to drill and sample soil borings from the ground surface to the base of the vadose zone, sampling at five-foot intervals.

In summary, the soil borings will be located to optimize sampling resources while obtaining the data needed to characterize the area for evaluation of remedial alternatives.

6.2 OUTLINE OF CLOSURE REQUIREMENTS

The ITT site is located in the Cities of Glendale and Burbank, in the County of Los Angeles. The county requirements for closure of underground storage tanks (USTs), which includes sumps, are included with the county's application and permit. The "Application for Closure, Hazardous Materials Underground Storage" is available from:

County of Los Angeles
Department of Public Works
P.O. Box 1460
Alhambra, CA 91802-1460
(818) 458-3513

The fee for closure is \$141.00 for the first tank, and \$38.00 for each additional tank. Governmental inspectors that must be notified prior to tank removal include the Department of Public Works inspector, the City Fire Department inspector, and the Air Quality Management District inspector. A plot plan of the site is also required.

The City of Burbank's closure requirements are outlined in the "Procedure for Contractor Work, Removal of Underground Storage Tanks," City of Burbank Fire Department. That document lists the following agencies from whom permits must be obtained for tank closure: 1) Los Angeles County, Department of Public Works, 2) Burbank Building Department (Business License), and 3) Burbank Fire Department. The contractor who performs the tank removal must have an appropriate state contractor's license, and the generator (owner) must obtain an EPA identification number.

The City of Glendale's requirements for tank closure follow those of the County of Los Angeles. The Glendale Fire Department must be notified prior to tank closure.

Section 7

SECTION 7

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Appendix A

APPENDIX A

BORING LOGS FROM PREVIOUS INVESTIGATIONS



LOCATION OF BORING: ITT Glendale/Burbank				JOB NO. 87-07(0007) CLIENT: ITT				BORING NO. 11			
LOCATION SKETCH See Location Map				PROJECT NAME: ITT Hazardous Waste Investigation							
				DRILLING METHOD: Hollow Stem Auger							
				DRILL RIG TYPE: Mobil B-53							
				SAMPLING METHOD: Split-Tube Soil Sampler							
				SAMPLE STORAGE METHOD: Cooler with Blue Ice							
DATUM: N/A		ELEVATION: N/A		WATER LEVEL: 45-50'		START TIME: 7:30 A.M.		FINISH TIME: 8:40 A.M.			
				TIME: 8:40							
				DATE: 5/13		START DATE: 5/13/88		FINISH DATE: 5/13/88			
				CASING DEPTH: N/A							
				SURFACE CONDITION: Asphalt Driveway.							
				SOIL DESCRIPTION							
SAMPLE NUMBER	BLOWS PER SIX INCHES	TLV READING (PPM)	TIME AT NOTED DEPTH	DEPTH IN FEET	SOIL TYPE	GRAPHIC LOG					
			7:39	0							
11-2	2/3	38	7:44	2			Clayey silt				
				5			Tan; damp; medium grained sand with some very small pebbles; grains consist of Quartz, plagioclase, Kspar, and biotite; no odor.				
11-5	2/3	52	7:46	10			Black; damp; silty clay; no odor; malleable; silt is Quartz.				
11-10	7/10	36	7:51	15			Clayey silt (≈ 30% clay and 70% silt with some sand and some very small pebbles); tan; damp; no odor.				
11-15	8/10	38	7:55	20			Fine to very coarse-grained sand with some very small pebbles; tan; damp; unconsolidated; no odor; consists of Quartz, Kspar, plagioclase and biotite.				
11-20	19/38	32	8:01	25			Silt to very coarse-grained sand with some very small pebbles; tan to grey; damp; unconsolidated; no odor; consists of Quartz, Kspar, plagioclase, and biotite.				
11-25		42	8:06	30			Unconsolidated sand of Quartz, Kspar, and plagioclase; tan; damp; no odor.				
11-30	20/25		8:12	35			Fine to medium-grained sand with some very small pebbles; tan; damp; unconsolidated; Quartz, plagioclase, Kspar, and biotite present; no odor.				
11-35	9/14	40	8:18	40							
DRILLING CONTRACTOR: Gregg Drilling				LOGGED BY: Robert J. Loudon							
DRILLER(S): Greg and Jeff				DATE: 6/15/88				CHECKED BY:			



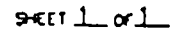
LOCATION OF BORING:						JOB NO.	87-07(0007)				CLIENT:	ITT				BORING NO.	11		
Glendale/Burbank						PROJECT NAME: ITT Hazardous Waste Investigation													
LOCATION SKETCH See Location Map						DRILLING METHOD: Hollow Stem Auger													
						DRILL RIG TYPE:													
						SAMPLING METHOD: Split-Tube Soil Sampler													
						SAMPLE STORAGE METHOD: Cooler with Blue Ice													
						WATER LEVEL				45-50'						START TIME			
TIME				8:40						7:30 A.M.				8:40					
DATE				5/13						START DATE				FIN DA					
DATUM:		N/A		ELEVATION:		N/A		CASING DEPTH		N/A						5/13/88		5/1	
SURFACE CONDITION: Asphalt driveway.						SOIL DESCRIPTION													
						<p>Silty sandy clay (sand 20%, silt 30%, and clay 50% dark brown; damp; low plasticity; no odor; some coarse grains of sand present.</p> <p>Medium-grained sand with some very small pebbles; damp to moist; tan with some slight red stains; consisted of Quartz, Kspar, plagioclase and biotite.</p> <p>Tan to grey; saturated; no odor; coarse-grained of Quartz, Kspar; plagioclase, and biotite with about 10-15% silt; clay layer is right below 50 feet.</p>													
SAMPLE NUMBER	BLOWS PER SIX INCHES	TLV READING (PPM)	TIME AT NOTED DEPTH	DEPTH IN FEET	SOIL TYPE	GRAPHIC LOG													
11-40	14/24	63	8:23	40	CL	[Hatched Pattern]													
				45	SP	[Dotted Pattern]													
11-45	19/49	40	8:30																
				50	SW	[Diagonal Lines]													
11-50	28/46	34	8:40																
				55		[Question Mark]													
				60															
				65															
				70															
				75															
				80															



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SHEET 1 of 1

LOCATION OF BORING: ITT Glendale/Burbank				JOB NO. 87-07(0007) CLIENT: ITT				BORING NO. 17			
LOCATION SKETCH See Location Map				PROJECT NAME: ITT Hazardous Waste Investigation							
				DRILLING METHOD: Hollow Stem Auger							
				DRILL RIG TYPE: Mobil B-24							
				SAMPLING METHOD: Split-Tube Soil Sampler							
				SAMPLE STORAGE METHOD: Cooler with Blue Ice							
DATE: N/A		ELEVATION: N/A		CASING DEPTH: N/A		WATER LEVEL: N/A		START TIME: 8:10 A.M.		FINISH TIME: 9:30 A.M.	
								START DATE: 6/16/88		FINISH DATE: 6/16/88	
SURFACE CONDITION: Concrete over soil											
SOIL DESCRIPTION											
SAMPLE NUMBER	BLOWS PER SIX INCHES	TLV READING (PPM)	TIME AT NOTED DEPTH	DEPTH IN FEET	SOIL TYPE	GRAPHIC LOG					
			8:20	0			<p>Gray, silty sand; dry to damp; fine to coarse-grained sand of quartz, kspar and plagioclase.</p> <p>Black, damp, malleable, plastic-like silty clay (quartz, silt and some sand grains present).</p> <p>Brown to dark tan, damp, silty sand with some very small pebbles present; contains quartz, kspar, plagioclase and biotite.</p> <p>Sand to gravel; very fine sand (to pea-size gravel); quartz, kspar and plagioclase grains and biotite granite fragments; dark tan, dry to damp, no odor.</p> <p>Tan to brown, damp, unconsolidated sand to gravel (fine to coarse sand) quartz, kspar and biotite granite pieces; poorly sorted.</p>				
17-2	2/3		8:23	2	SM						
				5	OL						
17-5	3/3		8:28								
				10	SM						
17-10	7/9		8:41								
				15	GP						
17-15	11/17		9:00								
				20	SP						
17-20			9:22								
				25							
				30							
				35							
				40							
DRILLING CONTRACTOR: Gregg Drilling				LOGGED BY: Robert J. Loudon							
DRILLER(S): Greg and Jeff				DATE: 8/3/88				CHECKED BY:			



DATE: 6/21/88 CHECKED BY:



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SHEET 1 of 1

LOCATION OF BORING: ITT Glendale/Burbank				JOB NO. 87-07(0007) CLIENT: ITT				BORING NO. 19		
LOCATION SKETCH See Location Map				PROJECT NAME: ITT Hazardous Waste Investigation						
				DRILLING METHOD: Hollow Stem Auger						
				DRILL RIG TYPE: Mobile B-24						
				SAMPLING METHOD: Split-Tube Soil Sampler						
				SAMPLE STORAGE METHOD: Cooler with Blue Ice						
DATE: N/A		ELEVATION: N/A		WATER LEVEL: N/A		START TIME: 10:20 A.M.		FINISH TIME: 2:00 P.M.		
				TIME: N/A						
				DATE: N/A		START DATE: 6/16/88		FINISH DATE: 6/16/88		
				CASING DEPTH: N/A						
				SURFACE CONDITION: Concrete over soil.						
				SOIL DESCRIPTION						
SAMPLE NUMBER	BLOWS PER SIX INCHES	TLV READING (PPM)	TIME AT NOTED DEPTH	DEPTH IN FEET	SOIL TYPE	GRAPHIC LOG	<p>Gray, damp; very fine sand; Quartz and biotite present; some strange odor present; unconsolidated; well sorted.</p> <p>Gray, damp; clayey sand; fine-grained sand with about 25% clay; Quartz, Kspar, and plagioclase present.</p> <p>Tan to brown; fine to medium-grained sand of Quartz, Kspar, and plagioclase; moderately sorted; damp.</p> <p>Tan to brown; sandy silt with pea-size gravel; damp; Quartz, Kspar, and plagioclase, and biotite present.</p> <p>Silty sandy clay, dark brown; damp; elastic; Quartz silt with very coarse grains of Quartz and Kspar.</p> <p>Dark brown; fine grained, well sorted sand; damp; unconsolidated; Quartz, Kspar and plagioclase present.</p> <p>Sandy silt; dark tan; damp; approximately 20% clay, 30% sand, and 50% silt. Broke for lunch at 12:30 and resumed at 1:10.</p> <p>Dark tan; damp; silty clay with some very coarse grains present.</p>			
19-2	7/6		10:30	0	SW					
			10:36	2						
				5	SC					
19-5	7/7		10:41							
				10	SM					
19-10										
				15	ML					
19-15	8/8		10:59							
				20	CH					
19-20	9/12		11:15							
				25	SW					
19-25										
				30	ML					
19-30			12:25							
				35	CL					
19-35			1:50							
				40						
DRILLING CONTRACTOR: Gregg Drilling				LOGGED BY: Robert J. Loudon						
DRILLER(S): Greg and Jeff				DATE: 8/3/88				CHECKED BY:		



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SHEET 1 of 1

LOCATION OF BORING: ITT Glendale/Burbank				JOB NO. 87-07(0007) CLIENT: ITT				BORING NO. 25		
LOCATION SKETCH See Location Map				PROJECT NAME: ITT Hazardous Waste Investigation						
				DRILLING METHOD: Hollow Stem Auger						
				DRILL RIG TYPE: Mobile B-24						
				SAMPLING METHOD: Split-Tube Soil Sampler						
				SAMPLE STORAGE METHOD: Cooler with Blue Ice						
WATER LEVEL		N/A				START TIME		FINISH TIME		
TIME		N/A				10:30 A.M.		2:00 P.M.		
DATE		N/A				START DATE		FINISH DATE		
5/16/88		5/16/88								
DATUM: N/A		ELEVATION: N/A		CASING DEPTH		N/A				
				SURFACE CONDITION: Concrete in building 2						
				SOIL DESCRIPTION						
SAMPLE NUMBER	BLOWS PER SIX INCHES	TLV READING (PPM)	TIME AT NOTED DEPTH	DEPTH IN FEET	SOIL TYPE	GRAPHIC LOG	<p>Silt and very fine sand to fine to medium-grained sand; grey; damp; stinky musty odor; quartz, kspar and plagioclase grains and 10-15% clay present.</p> <p>Fine to medium-grained sand with some very small pebbles with approximately 15% silt; tan; damp; no odor.</p> <p>Very fine sand and silt with some very coarse sand grains; tan; damp; unconsolidated; no odor; quartz, plagioclase and kspar present.</p> <p>Could only get down to 16ft.</p>			
			10:30	0						
				2						
25-5		76	10:44	3	SM					
				5						
				7						
25-10	6/7	76	11:06	10	SM					
				12						
				14						
25-15	12/14	84	11:38	15	ML					
				16						
			2:00	18						
				20						
				22						
				24						
				26						
				28						
				30						
				32						
				34						
				36						
				38						
				40						
DRILLING CONTRACTOR: Gregg Drilling				LOGGED BY: Robert J. Loudon						
DRILLER(S): Greg and Jeff				DATE: 6/15/88		CHECKED BY:				

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1162 N. KRAEMER PL
ANAHEIM, CA 92806

SHEET 1 of 1

LOCATION OF BORING: ITT Glendale/Burbank		JOB NO. 87-07(0007) CLIENT: ITT		BORING NO. 27			
LOCATION SKETCH See Location Map		PROJECT NAME: ITT Hazardous Waste Investigation					
		DRILLING METHOD: Hollow Stem Auger					
		DRILL RIG TYPE: Mobile B-24					
		SAMPLING METHOD: Split-Tube Soil Sampler					
		SAMPLE STORAGE METHOD: Cooler with Blue Ice					
DATE: N/A		ELEVATION: N/A		CASING DEPTH: N/A			
WATER LEVEL: N/A		TIME: N/A		DATE: N/A			
START TIME: 11:50 A.M.		FINISH TIME: 1:20 P.M.		START DATE: 6/14/88			
FINISH DATE: 6/14/88		CASING DEPTH: N/A		DATE: 6/14/88			
SURFACE CONDITION:							
SOIL DESCRIPTION							
SAMPLE NUMBER	BLOWS PER SIX INCHES	TLV READING (PPM)	TIME AT NOTED DEPTH	DEPTH IN FEET	SOIL TYPE	GRAPHIC LOG	
27-2			12:07	0	MH		Grey, damp; somewhat malleable; no odor; clayey silt (quartz).
27-5	4/5		12:16	5	MH		Black dirt (60% silt, 40% clay with some very coarse grains); damp; low plasticity; no odor.
27-10	10/11		12:25	10	SM		Tan to brown, damp, unconsolidated silty sand (25% silt, 70% fine to coarse sand of quartz, kspar and plagioclase with some very small pebbles); no odor.
27-15	11/13		12:35	15	SM		Dark tan, damp, unconsolidated, somewhat malleable silty sand (45% silt, 55% very fine sand with some very coarse sand grains).
27-20			1:10	20	SP		Tan to brown to dark brown very fine sand to very coarse sand with some silt present; poorly sorted; unconsolidated; dry to damp; quartz, kspar and plagioclase present.
				25			
				30			
				35			
				40			
DRILLING CONTRACTOR: Gregg Drilling							LOGGED BY: Robert J. Loudon
DRILLER(S): Greg and Jeff							DATE: 7/21/88 CHECKED BY:



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SHEET 1 of 1

LOCATION OF BORING: ITT Glendale/Burbank				JOB NO. 87-07(0007) CLIENT: ITT		BORING NO. 29		
LOCATION SKETCH See Location Map				PROJECT NAME: ITT Hazardous Waste Investigation				
				DRILLING METHOD: Hollow Stem Auger				
				DRILL RIG TYPE: Mobile B-24				
				SAMPLING METHOD: Split-Tube Soil Sampler				
				SAMPLE STORAGE METHOD: Cooler with Blue Ice				
DATE: N/A		ELEVATION: N/A		CASING DEPTH: N/A		WATER LEVEL: N/A	START TIME: 8:50 A.M.	FINISH TIME: 10:03 A.M.
						TIME: N/A	START DATE: 6/14/88	FINISH DATE: 6/14/88
						DATE: N/A		
				SURFACE CONDITION: Concrete in building 2				
				SOIL DESCRIPTION				
SAMPLE NUMBER	BLOWS PER SIX INCHES	TLV READING (PPM)	TIME AT NOTED DEPTH	DEPTH IN FEET	SOIL TYPE	GRAPHIC LOG		
			8:50	0			Quartz silt and organic clay/dirt with some very coarse-grained sand; damp; black to very dark brown; no odor.	
29-2	4/4		8:55	2	OL			
				5	SM		Very fine to medium-grained sand (50%), clay (20%) and quartz silt and small biotite granite pieces (30%); very dark brown; dry to damp; color change in soil from dark brown to brown/ton.	
29-5	4/5		9:07					
				10	SP		Fine to coarse-grained unconsolidated sand of quartz, kspar, plagioclase and biotite with some very small pebbles present; dry to damp; brown to tan.	
29-10	6/10		9:21					
				15	SM		Silty sand (40% quartz silt, 10% clay and 50% very fine to very coarse-grained sand) with some small pebbles of biotite granite; dark brown; dry to damp; unconsolidated.	
29-15	13/14		9:31					
				20	SM		Silty sand with some small pebbles; dark brown; dry to damp.	
29-30	16/12		9:55					
				25				
				30				
				35				
				40				
DRILLING CONTRACTOR: Gregg Drilling				LOGGED BY: Robert J. Loudon				
DRILLER(S): Greg and Jeff				DATE: 6/21/88 CHECKED BY:				



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SHEET 1 of 1

LOCATION OF BORING: ITT Glendale/Burbank				JOB NO. 87-07(0007) CLIENT: ITT		BORING NO. 30	
LOCATION SKETCH See Location Map				PROJECT NAME: ITT Hazardous Waste Investigation			
				DRILLING METHOD: Hollow Stem Auger			
				DRILL RG TYPE: Mobile B-40/Mobile B-50			
				SAMPLING METHOD: Split-Tube Soil Sampler			
				SAMPLE STORAGE METHOD: Cooler with Blue Ice			
DATE: 7/19/88		TIME: 8:53 A.M.		WATER LEVEL: 47ft		START TIME 12:20 P.M.	FINISH TIME 9:10 A.M.
ELEVATION: N/A		CASING DEPTH: N/A		START DATE 7/11/88		FINISH DATE 7/19/88	
SURFACE CONDITION:							
SOIL DESCRIPTION							
SAMPLE NUMBER	BLOWS PER SIX INCHES	TLV READING (PPM)	TIME AT NOTED DEPTH	DEPTH IN FEET	SOIL TYPE	GRAPHIC LOG	
			12:23	0			
			Lunch	2	?	?	
			Break	5	SC		Black; damp; malleable; 15% silt, 25% clay and 60% fine to medium-grained sand with some coarse sand grains.
28-5	3/3		1:10				
				10	SC		Dark tan to brown; 70% medium to fine-grained sand with pebbles; 20% clay and 10% quartz silt; damp; plagioclase, kspar, quartz and biotite present.
28-10	4/5		1:32				
				15	SP		Dark tan; dry to damp; fine to medium-grained sand with pieces and chunks of biotite granite; quartz, kspar and plagioclase present; unconsolidated.
30-15	17/26		7:44				
				20	ML		Dark tan; damp; somewhat malleable; 65% silt, 15-20% sand, 15% clay; no TLV.
30-20	6/2		7:52				
				25	GP		Lots of cobbles coming up in the cuttings at this depth; sample is tan to grey; dry, unconsolidated; very fine to very coarse sand with pebbles and chunks of biotite granite; quartz, kspar and plagioclase present.
30-25	6/12		7:44				
				30	SM		Silty sand; 20% clay, 75% very fine sand, 5% medium to coarse-grained sand; dark tan; damp; silt is quartz.
30-30	7/9		8:08				
				35	SM		Tan; damp; 90% quartz silt to coarse sand and 10% clay; somewhat malleable; no TLV.
30-35	5/8		8:15				
				40	SC		Clayey sand (35% clay, 20% quartz silt, 45% sand); dark brown; no TLV.
30-40	12/12		8:22				Drilled to 47ft and hit water.
DRILLING CONTRACTOR: Pioneer Drilling				LOGGED BY: Robert J. Loudon			
DRILLER(S): Elliot and Travis				DATE: 7/21/88 CHECKED BY:			



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SHEET 1 of 1

LOCATION OF BORING: ITT Glendale/Burbank				JOB NO. 87-07(0007) CLIENT: ITT				BORING NO. 32	
LOCATION SKETCH See Location Map				PROJECT NAME: ITT Hazardous Waste Investigation					
				DRILLING METHOD: Hollow Stem Auger					
				DRILL RIG TYPE: Mobile B-50					
				SAMPLING METHOD: Split-Tube Soil Sampler					
				SAMPLE STORAGE METHOD: Cooler with Blue Ice					
DATE: N/A		ELEVATION: N/A		CASING DEPTH: N/A		WATER LEVEL: N/A		START TIME 10:30 A.M.	FINISH TIME 12:10 P.M.
								START DATE 7/18/88	FINISH DATE 7/18/88
SURFACE CONDITION:									
SOIL DESCRIPTION									
SAMPLE NUMBER	BLOWS PER SIX INCHES	TLV READING (PPM)	TIME AT NOTED DEPTH	DEPTH IN FEET	SOIL TYPE	GRAPHIC LOG			
32-2	2/2		10:44	0	CH		Grey; damp; 40% quartz silt and 60% clay with some sand grains and pebbles present; some solvent odor.		
32-5	2/2		10:49	3	MH		Black; damp; 35% clay, 15% sand and 50% silt; somewhat soft and malleable; no TLV.		
				8	GP		No description, hit gravel at 8ft.		
32-10	4/4		11:09	10	ML		Tan to light brown; damp; 30% clay, 20% very coarse sand and 50% quartz silt; soft; somewhat malleable; no TLV.		
32-15	11/9		11:17	15	SM		Tan; damp; 15% silt, 85% sand; sand is very fine to very coarse; fairly poorly sorted; quartz, kspar and plagioclase present.		
32-20	15/9		11:25	20	SM		Tan; damp; silty sand; 25% silt and 75% fine to coarse-grained sand with some pebbles present; no TLV.		
32-25	14/20		11:33	25	GP		Tan to grey; damp; unconsolidated; fine to very coarse-grained sand with large pebbles and cobbles; quartz, kspar and plagioclase present; no TLV.		
32-30	7/9		11:42	30	SC		Dark tan; damp to moist; 20% clay, 20% silt and fine sand and 60% medium to coarse-grained sand; no TLV.		
32-35	9/7		11:49	35	SP		Tan; damp; unconsolidated; fine to coarse-grained sand of quartz, kspar and plagioclase grains; clay zone present in sample.		
32-40	13/17		11:59	40	ML		Dark tan; damp; 20% clay, 20% coarse to fine-grained sand and 60% quartz silt; no TLV.		
DRILLING CONTRACTOR: Pioneer Drilling LOGGED BY: Robert J. Loudon									
DRILLER(S): Elliot and Travis DATE: 7/22/88 CHECKED BY:									



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1162 N. KRAEMER PL.
ANAHEIM, CA 92806

SHEET 1 of 1

LOCATION OF BORING: ITT Glendale/Burbank				JOB NO. 87-07(0007) CLIENT: ITT		BORING NO. 34	
LOCATION SKETCH See Location Map				PROJECT NAME: ITT Hazardous Waste Investigation			
				DRILLING METHOD: Hollow Stem Auger			
				DRILL RIG TYPE: Mobil B-50			
				SAMPLING METHOD: Split-Tube Soil Sampler			
				SAMPLE STORAGE METHOD: Cooler with Blue Ice			
DATE: N/A		ELEVATION: N/A		WATER LEVEL: N/A		START TIME: 9:10 A.M.	
				TIME: N/A		FINISH TIME: 10:20 P.M.	
				DATE: N/A		START DATE: 7/19/88	
				CASING DEPTH: N/A		FINISH DATE: 7/19/88	
				SURFACE CONDITION: Concrete over soil.			
				SOIL DESCRIPTION			
SAMPLE NUMBER	BLOWS PER SIX INCHES	TLV READING (PPM)	TIME AT NOTED DEPTH	DEPTH IN FEET	SOIL TYPE	GRAPHIC LOG	
			9:20	0			
34-2	2/2		9:21	2	MH		
				3	ML		
34-5	2/3		9:24				
				10	ML		
34-10	4/5		9:28				
				15	SP		
34-15	4/4		9:35				
34-20	6/8		9:40	20	SP		
				25	SP		
34-25	16/20		9:47				
				30	SM		
34-30	4/9		9:54				
34-35	14/9		10:00	35	SM		
				40	MH		
34-40	7/9		10:08				
						Gray, damp; clayey silt (25% clay, and 75% Qtz silt); somewhat malleable; no TLV.	
						Very dark brown to black; clay = 10%, Qtz. silt and fine sand = 90%; no TLV.	
						Very dark brown to black; clayey silt (10% clay and 90% Qtz. silt).	
						Tan; damp; unconsolidated very fine to very coarse grained sand with some very small pebbles; Qtz, Kspar, plagioclase and biotite present; no TLV.	
						Tan; damp; unconsolidated very fine to very coarse grained sand and small angular pebbles; iron oxide blotches present along with Qtz, Kspar, plagioclase, and biotite.	
						Tan to gray; damp; unconsolidated; fine to coarse grained sand with small rounded pebbles; Qtz, Kspar, plagioclase and biotite present; no TLV.	
						Dark tan; damp; silty sand (clay = 10%, silt = 35%, and fine to coarse sand = 55%); somewhat malleable.	
						Tan; dry to damp; silty sand (10% clay, 35% silt and 55% fine to coarse-grained sand); some small pebbles present; Qtz, Kspar, and plagioclase present.	
						Gray with slight green tint; lots of iron oxide blotches present; damp; 35-40% clay, 60% silt and very fine sand.	
DRILLING CONTRACTOR: Pioneer Drilling				LOGGED BY: Robert J. Loudon			
DRILLER(S): Elliot and Travis				DATE: 7/25/88 CHECKED BY:			



DATE: 1-4-89 CHECKED BY R.C.F.



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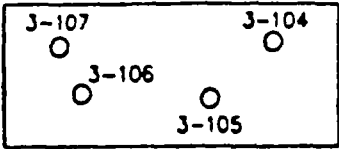
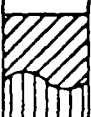




SHEET 1 of 1

LOCATION OF BORING: ITT Glendale/Burbank				JOB NO. 87-07-0011		CLIENT: ITT		BORING NO. 3-104			
LOCATION SKETCH Plating Passivate Area				PROJECT NAME: ITT Hazardous Waste Investigation							
				DRILLING METHOD: Hollow Stem Auger							
				DRILL RIG TYPE: Simco 2800 HSHT							
				SAMPLING METHOD: Split-tube Soil Sampler							
				SAMPLE STORAGE METHOD: Cooler with Blue Ice							
				WATER LEVEL				START TIME		FINISH TIME	
				TIME		9:30		9:30 A.M.		10:32 A.M.	
				DATE		1/17/89		START DATE		FINISH DATE	
								1/17/89		1/17/89	
DATE:				ELEVATION: $\approx 508'$		CASING DEPTH					
				SURFACE CONDITION: Concrete covering damp, clayey silt							
				SOIL DESCRIPTION							
SAMPLE NUMBER	BLOWS PER SIX INCHES	TLV READING (PPM)	TIME AT NOTED DEPTH	DEPTH IN FEET	SOIL TYPE	GRAPHIC LOG					
104-S	18/18	38	9:30	0	ML		Clayey silt (75% silt, 25% clay, <3% medium to coarse granitic sands); no odor; malleable; medium to dark brown.				
104-5'	30/18	57	9:37	5	ML		Sandy silt (80% silt, 20% sand); fine-grained quartz-feldspar sand; some coarser sand and clasts up to 1/4" diameter; low malleability; no odor; medium brown.				
104-10'	50/18	74	9:46	10	ML		Clayey silt (80% silt, 20% clay); some isolated granitic clasts up to 1/4" diameter; malleable; no odor; damp; medium brown.				
104-15'	29/18	81	10:09	15	ML		Sandy silt (60% silt, 40% sand); fine-grained sand; quartz and feldspar; damp; slightly malleable; no odor; medium brown.				
104-20'	23/18	8	10:32	20	ML		Clayey silt (55% silt, 45% clay); isolated granitic clasts up to 1/4" diameter; highly malleable; no odor; medium to dark brown.				
				25							
				30							
				35							
				40							
DRILLING CONTRACTOR: E.I.A.				LOGGED BY: J. L. Aldern							
DRILLER(S): Ken Barnett				DATE: 1/19/89		CHECKED BY R.C.E.					



A. L. B U R K E E N G I N E E R S
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SHEET 1 of 1

LOCATION OF BORING: ITT Glendale/Burbank				JOB NO. 87-07-0011		CLIENT: ITT		BORING NO. 3-105									
LOCATION SKETCH Building 3 Emergency Shower Area 				PROJECT NAME: ITT Hazardous Waste Investigation													
				DRILLING METHOD: Hollow Stem Auger													
				DRILL RIG TYPE: Simco 2800 HSHT													
				SAMPLING METHOD: Split-Tube Soil Sampler													
				SAMPLE STORAGE METHOD: Cooler with Blue Ice													
DATUM:				ELEVATION: ≈ 508'		WATER LEVEL		START TIME		FINISH TIME							
						TIME 12:55		12:55 P.M.		2:00 P.M.							
						DATE 1-4-89		START DATE 1-4-89		FINISH DATE 1-4-89							
				CASING DEPTH													
				SURFACE CONDITION: Concrete covering sandy, silty clay													
				SOIL DESCRIPTION													
SAMPLE NUMBER				BLOWS PER SIX INCHES		TLV READING (PPM)		TIME AT NOTED DEPTH		DEPTH IN FEET		SOIL TYPE		GRAPHIC LOG			
105-1'				12/18		14		1:00		0		CL				Sandy, silty clay (70% clay, 20% silt, 10% fine to medium-grained sand); medium to high plasticity; biotite flakes; isolated grains of quartz and plagioclase; dark to medium brown.	
105-5'				21/18		2		1:05		5		ML				Sandy silt (60% silt, 30% fine to coarse-grained sand, 10% clay); some gravel of granitic composition; sand grains of plagioclase, quartz and kspar; no odor; low plasticity; medium brown.	
105-10'				37/18		40		1:25		10		SM				Silty sand (60% fine to medium-grained sand, 30% silt, 10% clay); isolated clasts up to 1/8" diameter; grains of plagioclase, quartz and biotite flakes; no odor; medium brown.	
105-15'				50/18		80		1:45		15		SP				Silty sand (90% fine to coarse-grained sand, 10% silt); grains of quartz, plagioclase, kspar, biotite, augite or hornblende; decomposed granitic composition; no odor; light brown to tan.	
105-20'				50/18		75		2:00		20		ML				Clayey sandy silt (70% silt, 20% clay, 10% sand); biotite, plagioclase and quartz grains visible; medium plasticity; granitic clasts up to 1/8" diameter; medium brown.	
										25							
										30							
										35							
										40							
DRILLING CONTRACTOR: EIA														LOGGED BY: Jeff Drew			
DRILLER(S): Ken Barnett														DATE: 1-4-89 CHECKED BY R.C.E.			



3-108

FINISH
DATE

1/17/89

SOIL DESCRIPTION

SURFACE CONDITION:	
Damp, sandy silt under concrete	
SOIL DESCRIPTION	
<p>Sandy silt (75% silt, 20% sand, 5% clay); fine-grained sand; quartz; feldspar; slightly malleable; no odor; medium brown.</p> <p>Sandy silt (75% silt, 20% sand, 5% clay); medium to coarse-grained sand; quartz; feldspar; no odor; slightly malleable; medium brown.</p> <p>Silty sand (60% sand, 35% silt, 5% clay); loose fine to medium-grained sand; quartz; feldspar; isolated granitic gravels and clasts up to 3/4" diameter; no odor; very slightly malleable; medium brown.</p> <p>Silty sand (85% sand, 15% silt); loose to medium fine-grained sand; quartz; feldspar; some granitic gravels and clasts up to 3/8" diameter; damp; no odor; light to medium brown.</p> <p>Silty clay (60% clay, 35% silt, 5% sand); medium to coarse-grained sand; quartz; feldspar; no odor; highly malleable; medium to dark brown.</p>	

DATE: 1/17/89 CHECKED BY R.C.E.

11TBNG22.DWG



A. L. B U R K E E N G I N E E R S
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SHEET 1 of 1

LOCATION OF BORING: ITT Glendale/Burbank				JOB NO. 87-07-0011		CLIENT: ITT		BORING NO. 3-110			
LOCATION SKETCH Plating Room Sump				PROJECT NAME: ITT Hazardous Waste Investigation							
				DRILLING METHOD: Hollow Stem Auger							
				DRILL RIG TYPE: Simco 2800 HSHT							
				SAMPLING METHOD: Split-tube Soil Sampler							
				SAMPLE STORAGE METHOD: Cooler with Blue Ice							
WATER LEVEL								START TIME		FINISH TIME	
TIME		10:00						10:00 A.M.		11:15 A.M.	
DATE		1/19/89						START DATE		FINISH DATE	
								1/19/89		1/19/89	
DATUM: $\approx 502'$		ELEVATION: $\approx 508'$		CASING DEPTH							
				SURFACE CONDITION: Damp sand in 6' deep sump							
				SOIL DESCRIPTION							
SAMPLE NUMBER	BLOWS PER SIX INCHES	TLV READING (PPM)	TIME AT NOTED DEPTH	DEPTH IN FEET	SOIL TYPE	GRAPHIC LOG					
6' 110-S	18/18	56	10:05	0							
11' 110-5'	23/18	76	10:20	5	SM						
16' 110-10'	49/18	98	10:37	10	ML						
21' 110-15'	50/18	98	11:00	15	SM						
26' 110-20'	47/18	72	11:15	20	ML						
				25	CL	Silty clay (50% clay, 45% silt, 5% sand); medium-grained quartz-feldspar sand; granitic clasts up to 1/2" diameter; biotite; high malleability; no odor; light to medium brown.					
				30							
				35							
				40							

*Note: Datum is 6 feet below ground surface.

DRAWING CONTRACTOR: E.I.A. LOGGED BY: J. L. Aldern
DRAWER(S): Ken Barnett DATE: 1/20/89 CHECKED BY R.C.E.

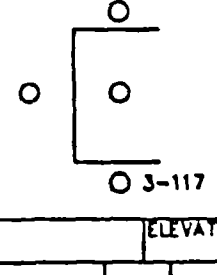






A. L. B U R K E E N G I N E E R S
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SHEET 1 of 1

LOCATION OF BORING: ITT Glendale/Burbank				JOB NO. 87-07-0011		CLIENT: ITT		BORING NO. 3-112	
LOCATION SKETCH Building 3 Bright Dip Area				PROJECT NAME: ITT Hazardous Waste Investigation					
				DRILLING METHOD: Hollow Stem Auger					
				DRILL RIG TYPE: Simco 2800 HSHT					
				SAMPLING METHOD: Split-tube Soil Sampler					
				SAMPLE STORAGE METHOD: Cooler with Blue Ice					
WATER LEVEL								START TIME	FINISH TIME
TIME		10:41						10:41 A.M.	11:15 A.M.
DATE		12/30/88						START DATE	FINISH DATE
								12/30/88	12/30/88
DATE:		ELEVATION: ≈ 508'		CASING DEPTH					
				SURFACE CONDITION: Compacted soil					
				SOIL DESCRIPTION					
SAMPLE NUMBER	BLOWS PER SIX INCHES	TLV READING (PPM)	TIME AT NOTED DEPTH	DEPTH IN FEET	SOIL TYPE	GRAPHIC LOG			
112-S	50/18	80	10:41	0					
112-5'	50/18	100	10:59	5	SM		Silty sand (55% sand, 30% silt, 10% gravel, 5% clay); granitic gravels and clasts up to 1" diameter; quartz and plagioclase; slightly malleable; no odor; light to medium brown.		
112-10'	50/18	150	11:08	10	CL		Silty clay (50% clay, 40% silt, 10% sand); 3/4" diameter granitic clast; quartz-feldspathic sand; malleable; no odor; light to medium brown.		
112-15'	50/18	300	11:15	15					
				20					
				25					
				30					
				35					
				40					
DRILLING CONTRACTOR: E.I.A.				LOGGED BY: J. L. Aldern (Sampler: J. T. Robinson)					
DRILLER(S): Ken Barnett				DATE: 12/30/88 CHECKED BY R.C.E.					



LOCATION OF BORING:				JOB NO. 87-07-0011		CLIENT: ITT		BORING NO. 3-117											
III Glendale/Burbank				PROJECT NAME: ITT Hazardous Waste Investigation															
LOCATION SKETCH Building 3 - Bright Dip 				DRILLING METHOD: Hollow Stem Auger															
				DRILL RIG TYPE: Simco 2800 HSHT															
				SAMPLING METHOD: Split-tube Soil Sampler															
				SAMPLE STORAGE METHOD: Cooler with Blue Ice															
DATUM:				ELEVATION: ≈ 508'		WATER LEVEL		START TIME		FINISH TIME									
				CASING DEPTH		TIME 12:30		12:30 P.M.		1:17 P.M.									
				DATE 12/28/88		START DATE		FINISH DATE											
						12/28/88		12/28/88											
				SURFACE CONDITION: Compacted soil															
				SOIL DESCRIPTION															
SAMPLE NUMBER				BLOWS PER SIX INCHES		TLV READING (PPM)		TIME AT NOTED DEPTH		DEPTH IN FEET		SOIL TYPE		GRAPHIC LOG					
117-1'				28/18		62		12:30		0		CL				Silty clay (50% clay, 40% silt, 10% fine sand); hard; cemented; solvent odor; brown to purplish brown.			
117-5'				66/18		110		12:35		5		SM				Silty sand (70% fine to medium sand, 20% silt, 10% clay); cemented; very hard; strong solvent odor; light to medium brown.			
117-10'				74/18		62		12:50		10		CL				Sandy clay (75% clay, 20% sand, 5% silt); fine to medium-grained sand; not as firmly cemented as previous samples; strong solvent odor; light brown.			
117-15'				64/18		65		1:17		15		SM				(Grab sample from cuttings) Silty clayey sand (60% sand, 25% clay, 15% silt); kspar, plagioclase, quartz and well-sorted fine to medium-grained sand; some slightly larger pebbles; medium brown.			
										20									
										25									
										30									
										35									
										40									
DRILLING CONTRACTOR: E.I.A.																LOGGED BY: J. J. Drew			
DRILLER(S): Ken Barnett																DATE: 12/28/88		CHECKED BY: R.C.E.	



A. L. BURKE ENGINEERS

1182 N. KRAEMER PL.
ANAHEIM, CA 92806

SHEET 1 of 1

LOCATION OF BORING: ITT Glendale/Burbank				JOB NO. 87-07-0011		CLIENT: ITT		BORING NO. 3-118			
LOCATION SKETCH Building 3 Bright Dip 3-118 O				PROJECT NAME: ITT Hazardous Waste Investigation							
				DRILLING METHOD: Hollow Stem Auger							
				DRILL RIG TYPE: Simco 2800 HSHT							
				SAMPLING METHOD: Split-Tube Soil Sampler							
				SAMPLE STORAGE METHOD: Cooler with Blue Ice							
DATE: 12/29/88				ELEVATION: \approx 508'		CASING DEPTH		START TIME: 9:45 A.M.		FINISH TIME: 11:00 A.M.	
SURFACE CONDITION: Concrete covering silty clay											
SOIL DESCRIPTION											
SAMPLE NUMBER	BLOWS PER SIX INCHES	TLV READING (PPM)	TIME AT NOTED DEPTH	DEPTH IN FEET	SOIL TYPE	GRAPHIC LOG					
118-1'	46/18	18	9:50	0	CL		Silty clay (60% clay, 30% silt, 10% fine to medium-grained sand); dry; mild solvent odor; highly compacted; low plasticity; dark brown to purplish brown.				
118-5'	42/18	30	10:00	5	CL		Silty clay (60% clay, 30% silt, 10% fine to medium-grained sand); dry; mild solvent odor; highly compacted; low plasticity; dark brown with areas of yellowish brown soil.				
118-10'	50/18	40	10:20	10	SP		Fine to coarse-grained sand; damp; grains of plagioclase, kspar and quartz; strong solvent odor; light brown to light yellowish brown.				
118-15'	50/18	90	10:40	15	SP		Medium to coarse-grained sand with pebbles up to 1/8" diameter; damp; plagioclase, kspar and quartz grains visible; no plasticity; light yellowish brown.				
118-20'	45/18	98	11:00	20	ML		Sandy clayey silt (50% silt, 40% fine sand, 10% clay); dry; strong solvent odor; small grains of kspar, plagioclase and quartz along with biotite flakes; well sorted; no large clasts; medium brown; medium plasticity.				
DRILLING CONTRACTOR: EIA				LOGGED BY: Jeff Drew							
DRILLER(S): Ken Barnett				DATE: 12-29-88				CHECKED BY R.C.E.			



A. L. B U R K E E N G I N E E R S
1 1 6 2 N. K R A E M E R P L.
A N A H E I M, C A 9 2 8 0 6

SHEET 1 of 1

LOCATION OF BORING: ITT Glendale/Burbank				JOB NO. 87-07-0011		CLIENT: ITT		BORING NO. 3-119					
LOCATION SKETCH Building 3 Bright Dip O 3-119 				PROJECT NAME: ITT Hazardous Waste Investigation									
				DRILLING METHOD: Hollow Stem Auger									
				DRILL RIG TYPE: Simco 2800 HSHT									
				SAMPLING METHOD: Split-Tube Soil Sampler									
				SAMPLE STORAGE METHOD: Cooler with Blue Ice									
DATE:				ELEVATION:		CASING DEPTH		WATER LEVEL		START TIME		FINISH TIME	
										12:30		12:30 P.M.	
										12/29/88		1:45 P.M.	
										12/29/88		12/29/88	
SURFACE CONDITION: Concrete covering silty clay													
SOIL DESCRIPTION													
SAMPLE NUMBER	BLOWS FOR SIX INCHES	TLV READING (PPM)	TIME AT NOTED DEPTH	DEPTH IN FEET	SOIL TYPE	GRAPHIC LOG							
119-1'	16/18	40	12:40	0	CL		Silty clay (60% clay, 40% silt); dry, highly compacted; low malleability; no odor; dark brown to black.						
119-5'	16/18	75	12:55	5	CL		silty clay (50% clay, 40% silt, 10% fine sand); highly compacted; grains of plagioclase, quartz and biotite visible; no odor; dark brown.						
119-10'	36/18	30	1:00	10	CL		Sandy, silty clay (50% clay, 30% silt, 20% fine to coarse-grained sand); poorly sorted; clasts up to 1/4" diameter; highly compacted; malleable; medium brown.						
119-15'	25/18	32	1:20	15	SP		I was only able to get 1/3 of the sample due to an obstruction.						
119-20'	50/18	76	1:45	20	SC		Fine to coarse-grained sand; quartz, plagioclase, ksp and biotite grains present (decomposed granitic composition); no odor; medium brown.						
				25			Silty clayey sand (75% fine to medium-grained sand, 15% clay, 10% silt); low plasticity; grains of ksp, plagioclase, quartz and biotite; well sorted; medium to light brown.						
				30									
				35									
				40									
DRILLING CONTRACTOR: EIA LOGGED BY: Jeff Drew													
DRILLER(S): Ken Bornett DATE: 12-29-88 CHECKED BY R.C.E.													

Appendix B



APPENDIX B
COMPLETE DATABASE INVENTORY

A. L. BURKE--NOVEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	RESULTS (ug/kg)	NOTE:	ND - Not Detected (50) - Detection Limit • - May be due to l contamination.
1 2	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50)		
1 5	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50)		
1 10	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50)		
1 15	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50)		
1 20	SOLID	12-May-88	YES		EPA 8010	NO	ND(50)		
1 25	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50)		
1 30	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50)		
1 35	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50)		

A. L. BURKE--NOVEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	RESULTS (ug/kg)	NOTE:	ND - Not Detected (50) - Detection Limit * - May be due to l contamination.
1 40	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50)		
2 5		29-Mar-88	YES	UNKNOWN NO CHAIN OF CUSTODY FORM.	EPA 8010	NO	1,1,1-TCA 1,000. TCE 5,500. PCE 400. 1,1,2,2-PCA *		
2 2	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)		
2 5	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)		
2 10	SOLID	12-May-88	YES	EPA 8010	EPA 8010	NO	ND(50.)		
2 15	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)		
2 20	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)		

A. L. BURKE--NOVEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	RESULTS (ug/kg)	NOTE:	ND - Not Detected (50) - Detection Limit * - May be due to l contamination.
2 25	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)		
2 30	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)		
2 35	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)		
2 40	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)		
3	SOLID	23-Mar-88	YES	8240 AND pH	EPA 8040 EPA 8240	NO	ND(500.)(200.)		
3 2	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)		
3 5	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)		

A. L. BURKE--NOVEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	RESULTS (ug/kg)	NOTE:
								ND - Not Detected (50) - Detection Limit * - May be due to I contamination.
3 10	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
3 15	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
3 20	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
3 25	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
3 30	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
3 35	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
3 40	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
4 2	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
4 5	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
4 10	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
4 15	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
4 20	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
5 2	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)	
5 5	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)	
5 10	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)	
5 15	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)	
5 20	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)	
6 2	SOLID	11-May-88	YES	8010 CAM	EPA 8010 CAM METALS	NO	ND(50.)	
6 5	SOLID	11-May-88	YES	8010 CAM	EPA 8010 CAM METALS	NO	ND(50.)	
6 10	SOLID	11-May-88	YES	8010 CAM	EPA 8010 CAM METALS	NO	ND(50.)	
6 15	SOLID	11-May-88	YES	8010 CAM	EPA 8010 CAM METALS	NO	ND(50.)	
6 20	SOLID	11-May-88	YES	8010 CAM	EPA 8010 CAM METALS	NO	ND(50.)	
6 25	SOLID	11-May-88	YES	8010 CAM	EPA 8010 CAM METALS	NO	ND(50.)	
6 30	SOLID	11-May-88	YES	8010 CAM	EPA 8010 CAM METALS	NO	ND(50.)	

A. L. BURKE—NOVEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	RESULTS (ug/kg)	NOTE:
								ND - Not Detected (50) - Detection Limit * - May be due to l contamination.
6 35	SOLID	11-May-88	YES	8010 CAM	EPA 8010 CAM METALS	NO	ND(50.)	
6 40	SOLID	11-May-88	YES	8010 CAM	EPA 8010 CAM METALS	NO	ND(50.)	
7 2	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
7 5	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
7 10	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
7 15	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
7 20	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
7 25	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
7 30	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
7 35	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
7 40	SOLID	12-May-88	YES	8010	EPA 8010	NO	ND(50.)	
8 2	SOLID	17-May-88	YES	8010	EPA 8010	NO	ND(50.)	
8 2	SOLID	17-May-88	YES	8010	EPA 418.1	—	ND(50.)	
				(418.1 NOT REQUESTED)				
8 5	SOLID	17-May-88	YES	8010	EPA 8010	NO	ND(50.)	
8 5	SOLID	17-May-88	YES	8010				
				(418.1 NOT REQUESTED)	EPA 418.1	—		
							ND(50.)	
8 10	SOLID	17-May-88	YES	8010	EPA 8010	NO	ND(50.)	
8 10	SOLID	17-May-88	YES	8010	EPA 418.1	—		
				(418.1 NOT REQUESTED)			ND(50.)	
8 15	SOLID	17-May-88	YES	8010	EPA 8010	NO	ND(50.)	
8 20	SOLID	17-May-88	YES	8010	EPA 8010	NO	TCE 55. PCE 100.	
8 20	SOLID	17-May-88	YES	8010	EPA 418.1	—		
				(418.1 NOT REQUESTED)				
9 2	SOLID	17-May-88	YES	8010	EPA 8010	NO	ND(50.)	
9 2	SOLID	17-May-88	YES	8010	EPA 418.1	—		
				(418.1 NOT REQUESTED)				
9 5	SOLID	17-May-88	YES	8010	EPA 8010	NO	ND(50.)	
9 5	SOLID	17-May-88	YES	8010	EPA 418.1	—		
				(418.1 NOT REQUESTED)				
9 10	SOLID	17-May-88	YES	8010	EPA 8010	NO	ND(50.)	
9 10	SOLID	17-May-88	YES	8010	EPA 418.1	—	ND(50.)	
				(418.1 NOT REQUESTED)				
9 15	SOLID	17-May-88	YES	8010	EPA 8010	NO	ND(50.)	
9 15	SOLID	17-May-88	YES	8010	EPA 418.1	—		

A. L. BURKE--NOVEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	RESULTS (ug/kg)	NOTE: ND - Not Detected (50) - Detection Limit * - May be due to contamination.
				(418.1 NOT REQUESTED)				
9 20	SOLID	17-May-88	YES	8010	EPA 8010	NO	ND(50.)	
10 2	SOLID	18-Jun-88	YES	8010	EPA 8010	NO	ND(50.)	
11 2	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
11 5	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
11 10	SOLID			8010			ND(50.)	
							ND(50.)	
							ND(50.)	
11 15	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
11 20	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
11 25	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
11 30	SOLID			8010			ND(50.)	
							ND(50.)	
							ND(50.)	
11 35	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
11 40	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
11 45	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
11 50	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
12 2	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
12 5	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
12 10	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
12 15	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
12 20	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
12 25	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
12 30	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
12 35	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
12 40	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
12 45	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
12 50	SOLID	13-May-88	YES	8010	EPA 8010	NO	ND(50.)	
13 5	SOLID	09-May-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	PCE 90. *	
13B	SOLID	01-Jun-88	YES	8010	EOA 8010	NO	1,1,1-TCA 80. ✓	
13 5	SOLID	17-May-88	YES	8010	EPA 8010	NO	TCE 80. ✓	
13 10	SOLID	17-May-88	YES	8010	EPA 8010	NO	ND(50.)	
13 15	SOLID	17-May-88	YES	8010	EPA 8010	NO	ND(50.)	
13 19	SOLID	17-May-88	YES	8010	EPA 8010	NO	ND(50.)	
14 5	SOLID	09-May-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	PCE 85. * ✓	
				CHLORINATE EPA 8010 HYDROCARBONS		NO	TCE 150. ✓	
				CHLORINATE EPA 8010 HYDROCARBONS		NO	PCE 55. * ✓	
14 10	SOLID	09-May-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	ND(50.)	
14 15	SOLID	09-May-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	ND(50.)	
14 20	SOLID	09-May-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	ND(50.)	
15 5	SOLID	09-May-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	ND(50.)	
15 10	SOLID	09-May-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	ND(50.)	
15 15	SOLID	09-May-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	ND(50.)	

A. L. BURKE--NOVEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	RESULTS (ug/kg)	NOTE: ND - Not Detected (50) - Detection Limit * - May be due to l contamination.
15 20	SOLID	09-May-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	ND(50.)	
16 5	SOLID	11-May-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	ND(50.)	
16 10	SOLID	17-May-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	ND(50.)	
16 15	SOLID	17-May-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	ND(50.)	
16 20	SOLID	17-May-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	ND(50.)	
17 2	SOLID	16-Jun-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	ND(50.)	
17 5	SOLID	16-Jun-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	ND(50.)	
17 10	SOLID	16-Jun-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	ND(50.)	
17 15	SOLID	16-Jun-88	YES	CHLORINATE EPA 8010 HYDROCARBONS		NO	ND(50.)	
17 20	SOLID	16-Jun-88	YES	8010 EPA 8010		NO	ND(50.)	
17A	SOLID	17-May-88	YES	CAM METALS CAM METALS		NO		
17A	SOLID	17-May-88	YES	EPA 8010 EPA 8010		NO	1,1,1-TCA 1,200. TCE 1,200. PCE 350.	
17B	SOLID	01-Jun-88	YES	8010 EPA 8010		NO	1,1,1-TCA 40,000. TCE 2,000. PCE 1,500. ND(1000.)	
18 5	SOLID	17-May-88	YES	8010 EPA 8010		NO	1,1,1-TCA 400. TCE 1,900. PCE 2,100. ND(100.)	
18 10	SOLID	17-May-88	YES	8010 EPA 8010		NO	ND(50.)	
18 15	SOLID	17-May-88	YES	8010 EPA 8010		NO	ND(50.)	
18 20	SOLID	17-May-88	YES	8010 EPA 8010		NO	ND(50.)	
19 2	SOLID	16-Jun-88	YES	8010 EPA 8010		NO	ND(50.)	
19 5	SOLID	16-Jun-88	YES	8010 EPA 8010		NO	ND(50.)	
19 10	SOLID	16-Jun-88	YES	8010 EPA 8010		NO	ND(50.)	
19 15	SOLID	16-Jun-88	YES	8010 EPA 8010		NO	ND(50.)	
19 20	SOLID	16-Jun-88	YES	8010 EPA 8010		NO	ND(50.)	
19 25	SOLID	16-Jun-88	YES	8010 EPA 8010		NO	ND(50.)	
19 30	SOLID	16-Jun-88	YES	8010 EPA 8010		NO	ND(50.)	
19 35	SOLID	16-Jun-88	YES	8010 EPA 8010		NO	ND(50.)	
20 2	SOLID	11-May-88	YES	8010 EPA 8010		NO	ND(50.)	
20 2	SOLID	11-May-88	YES	CAM CAM METALS		NO	ND(50.)	
21 2	SOLID	11-May-88	YES	8010 EPA 8010		NO	ND(50.)	
21 2	SOLID	11-May-88	YES	CAM CAM METALS		NO	ND(50.)	

A. L. BURKE--NOVEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	RESULTS (ug/kg)	NOTE:	ND - Not Detected (50) - Detection Limit * - May be due to l contamination.
21 5	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
21 5	SOLID	11-May-88	YES	CAM	CAM METALS	NO	ND(50.)		
21 10	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
21 10	SOLID	11-May-88	YES	CAM	CAM METALS	NO	ND(50.)		
21 15	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
21 15	SOLID	11-May-88	YES	CAM	CAM METALS	NO	ND(50.)		
21 20	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
21 20	SOLID	11-May-88	YES	CAM	CAM METALS	NO	ND(50.)		
22 2	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
22 2	SOLID	11-May-88	YES	CAM	CAM METALS	NO	ND(50.)		
22 5	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
22 5	SOLID	11-May-88	YES	CAM	CAM METALS	NO	ND(50.)		
22 10	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
22 10	SOLID	11-May-88	YES	CAM	CAM METALS	NO	ND(50.)		
22 15	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
22 15	SOLID	11-May-88	YES	CAM	CAM METALS	NO	ND(50.)		
22 20	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
22 20	SOLID	11-May-88	YES	CAM	CAM METALS	NO	ND(50.)		
23 2	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
23 2	SOLID	11-May-88	YES	CAM	CAM METALS	NO	ND(50.)		
23 5	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
23 5	SOLID	11-May-88	YES	CAM	CAM METALS	NO	ND(50.)		
23 10	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
23 10	SOLID	11-May-88	YES	CAM	CAM METALS	NO	ND(50.)		
23 15	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
23 15	SOLID	11-May-88	YES	CAM	CAM METALS	NO	ND(50.)		
23 20	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
23 20	SOLID	11-May-88	YES	CAM	CAM METALS	NO	ND(50.)		
24 2	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
24 5	SOLID	11-May-88	YES	CYANIDE	EPA 9012	NO	ND(50.)		
24 10	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
24 15	SOLID	11-May-88	YES	CYANIDE	EPA 9012	NO	ND(50.)		
24 15	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)		
24 15	SOLID	11-May-88	YES	CYANIDE	EPA 9012	NO	ND(50.)		

A. L. BURKE--NOVEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	RESULTS (ug/kg)	NOTE: ND - Not Detected (50) - Detection Limit * - May be due to contamination.
24 20	SOLID	11-May-88	YES	8010	EPA 8010	NO	ND(50.)	
			YES	CYANIDE	EPA 9012			
25 5	SOLID	17-May-88	YES	8010	EPA 8010	NO	TCE 100.	
25 10	SOLID	17-May-88	YES	8010	EPA 8010	NO	TCE 150.	
25 15	SOLID	17-May-88	YES	8010	EPA 8010	NO	ND(50.)	
26 2	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	1,1,1-TCA 18,000. TCE 40,000. PCE 20,000. ND(1,000.)	
26 5	SOLID			8010				
26 10	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	1,1,1-TCA 2,600. TCE 8,400. PCE 7,000. ND(200.)	
26 15	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	1,1,1-TCA 1,000. TCE 4,000. PCE 3,400. ND(200.)	
26 20	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	1,1,1-TCA 2,500. TCE 7,500. PCE 12,000. ND(500.)	
27 2	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	TCE 300.	
27 5	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	ND(50.)	
27 10	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	ND(50.)	
27 15	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	ND(50.)	
27 18	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	ND(50.)	
28 2	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	ND(50.)	
28 5	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	ND(50.)	
28 10	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	ND(50.)	
29 2	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	ND(50.)	
29 5	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	ND(50.)	
29 10	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	ND(50.)	
29 15	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	ND(50.)	
29 20	SOLID	14-Jun-88	YES	8010	EPA 8010	NO	ND(50.)	
30 15	SOLID	19-Jul-88	YES	8010	EPA 8010	NO	ND(50.)	
30 20	SOLID	19-Jul-88	YES	8010	EPA 8010	NO	PCE 100.	
30 25	SOLID	19-Jul-88	YES	8010	EPA 8010	NO	ND(50.)	
30 30	SOLID	19-Jul-88	YES	8010	EPA 8010	NO	ND(50.)	
30 35	SOLID	19-Jul-88	YES	8010	EPA 8010	NO	ND(50.)	
30 40	SOLID	19-Jul-88	YES	8010	EPA 8010	NO	ND(50.)	
32 2	SOLID	18-Jul-88	YES	8010	EPA 8010	NO	PCE 250.	
32 5	SOLID	18-Jul-88	YES	8010	EPA 8010	NO	ND(50.)	
32 10	SOLID	18-Jul-88	YES	8010	EPA 8010	NO	TCE 55. PCE 200.	
32 15	SOLID	18-Jul-88	YES	8010	EPA 8010	NO	METHYL.CHL 800. *	

A. L. BURKE--NOVEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	RESULTS (ug/kg)	NOTE: ND - Not Detected (50) - Detection Limit * - May be due to l contamination.
32 20	SOLID	18-Jul-88	YES	EPA 8010	EPA 8010	NO	TCE 400. 1,1,1-TCA 6,000. TCE 12,000. PCE 26,000. ND(500.)	
32 25	SOLID	18-Jul-88	YES	EPA 8010	EPA 8010	NO	1,1,1-TCA 3,000. TCE 6,000. BROMOFORM 22,000. ND(1,000.)	
32 30	SOLID	18-Jul-88	YES	EPA 8010	EPA 8010	NO	1,1-DCE 2,000. C TETCHLOR 6,000. TCE 7,000. PCE 36,000. ND(1,000.)	
32 35	SOLID	18-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)	
32 40	SOLID	18-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)	
33 2	SOLID	18-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)	
33 5	SOLID	18-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)	
33 10	SOLID	18-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)	
33 15	SOLID	18-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)	
33 20	SOLID	18-JUL-88	YES	EPA 8010	EPA 8010	NO	METH CHO 300. *	
33 25	SOLID	18-JUL-88	YES	EPA 8010	EPA 8010	NO	METH CHL 300. * PCE 65.	
33 30	SOLID	18-JUL-88	YES	EPA 8010	EPA 8010	NO	METH CHL 300. *	
33 35	SOLID	18-JUL-88	NO	EPA 8010	EPA 8010	NO	ND(50.)	
33 40	SOLID	19-JUL-88	NO	EPA 8010	EPA 8010	NO	TCE 65. PCE 55.	
34 2	SOLID	19-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)	
34 5	SOLID	19-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)	
34 10	SOLID	19-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)	
34 15	SOLID	19-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)	
34 20	SOLID	19-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)	

A. L. BURKE--NOVEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	RESULTS (ug/kg)	NOTE:	ND - Not Detected (50) - Detection Limit * - May be due to l contamination.
34 25	SOLID	19-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)		
34 30	SOLID	19-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)		
34 35	SOLID	19-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)		
34 40	SOLID	19-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)		
35 2	SOLID	19-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)		
35 5	SOLID	19-JUL-88	YES	EPA 8010	EPA 8010	NO	ND(50.)		
35 10	SOLID	19-Jul-88	YES	8010	EPA 8010	NO	ND(50.)		
35 15	SOLID	19-Jul-88	YES	8010	EPA 8010	NO	ND(50.)		
35 20	SOLID	19-Jul-88	YES	8010	EPA 8010	NO	ND(50.)		
35 25	SOLID	19-Jul-88	YES	8010	EPA 8010	NO	ND(50.)		
35 30	SOLID	19-Jul-88	YES	8010	EPA 8010	NO	ND(50.)		
35 35	SOLID	19-Jul-88	YES	8010	EPA 8010	NO	ND(50.)		
35 40	SOLID	19-Jul-88	YES	8010	EPA 8010	NO	ND(50.)		

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD	ANALY- TICAL METHOD	WET PERFORMED	RESULTS	NOTE:	Methylene Chloride may be due to lab contamination.					
				REQUESTED	PERFORMED		UG/KG SOLID (UO/L LIQUID, SLUDGE--where noted)		ND - NOT DETECTED (100) SPECIFIES DETECTION LIMIT					
3 2W	LIQUID	24-Jun-88	YES	UNKNOWN	COPPER LEAD 6010 STLC	---	COPPER 500 ug/L (STLC) LEAD 2800 ug/L (STLC)							
3 1	CORE	06-Aug-88	YES	CAM	CAM METALS	---	TTLC: (ug/kg) ANTIMONY ARSENIC BARIUM BERYLL CADMIUM CHROM. TRI	ND(1000) 940 30,000 ND(200) 300 8,800	CHROM.HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(1000) 1,300 24,000 2,500 ND(20) ND(400)	NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	4,200 ND(100) ND(200) ND(300) 4,200 52,000		
3 2	CORE	06-Aug-88	YES	CAM	CAM METALS	YES	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM. TRI	ND(1000) 360 3,600 ND(200) ND(200) 18,000	CHROM.HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(1000) 2,400 42,000 2,000 ND(2000) 900	NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	3,900 ND(100) ND(200) ND(300) 4,200 18,000		
3 7	CORE	06-Aug-88	YES	CAM	CAM METALS	YES	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM. TRI	ND(1000) 1,300 42,000 ND(200) ND(200) 64,000	CHROM.HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(1000) 2,100 13,000 5,400 140 ND(400)	NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	7,000 ND(100) ND(200) ND(300) 7,800 28,000		
3 8	CORE	06-Aug-88	YES	CAM	CAM METALS	---	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM. TRI	ND(1000) 1,100 22,000 ND(200) ND(200) 38,000	CHROM.HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(1000) 1,200 8,900 3,600 ND(20) 400	NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	12,000 ND(100) ND(200) ND(300) 3,800 25,000		
3 9	CORE	06-Aug-88	YES	CAM	CAM METALS	YES	ANTIMONY ARSENIC BARIUM	ND(1000) 1,700 55,000	CHROM.HEX COBALT COPPER	ND(1000) 1,500 18,000	NICKEL SELENIUM SILVER	11,000 ND(100) 200		

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD REQUESTED	ANALY- TICAL METHOD PERFORMED	WET PERFORMED	RESULTS		NOTE:	Methylene Chloride may be due to lab contamination. ND - NOT DETECTED (100) SPECIES DETECTION LIMIT			
							UG/KG SOLID	(UG/L LIQUID, SLUDGE—where noted)					
							BERYLLIUM	ND(200)		LEAD	8,500	THALLIUM	ND(300)
							CADMIUM	500		MERCURY	120	VANADIUM	4,600
							CHROM.TRI	208,000		MOLYBDENUM	400	ZINC	175,000
3	10	CORE	06-Aug-88	YES	CAM	CAM METALS	---	ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)	NICKEL	3,700
							ARSENIC	1,200		COBALT	1,000	SELENIUM	ND(100)
							BARIUM	23,000		COPPER	5,200	SILVER	ND(200)
							BERYLLIUM	ND(200)		LEAD	4,400	THALLIUM	ND(300)
							CADMIUM	ND(200)		MERCURY	ND(20)	VANADIUM	3,800
							CHROM.TRI	15,000		MOLYBDENUM	ND(400)	ZINC	12,000
3	11	CORE	06-Aug-88	YES	CAM	CAM METALS	---	ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)	NICKEL	4,100
							ARSENIC	420		COBALT	1,800	SELENIUM	ND(100)
							BARIUM	200		COPPER	8,000	SILVER	ND(200)
							BERYLLIUM	ND(200)		LEAD	2,900	THALLIUM	ND(300)
							CADMIUM	400		MERCURY	ND(20)	VANADIUM	8,400
							CHROM.TRI	13		MOLYBDENUM	ND(40)	ZINC	183,000
3	12	CORE	06-Aug-88	YES	CAM	CAM METALS	YES	ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)	NICKEL	4,600
							ARSENIC	470		COBALT	1,600	SELENIUM	ND(100)
							BARIUM	28,000		COPPER	8,500	SILVER	ND(200)
							BERYLLIUM	ND(200)		LEAD	8,700	THALLIUM	ND(300)
							CADMIUM	1,800		MERCURY	ND(20)	VANADIUM	8,300
							CHROM.TRI	17,000		MOLYBDENUM	ND(400)	ZINC	178,000
3	13	CORE	06-Aug-88	YES	CAM	CAM METALS	YES	ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)	NICKEL	27,000
							ARSENIC	900		COBALT	4,700	SELENIUM	100
							BARIUM	58,000		COPPER	104,000	SILVER	3,800
							BERYLLIUM	ND(200)		LEAD	27,000	THALLIUM	ND(300)
							CADMIUM	64,000		MERCURY	15,000	VANADIUM	2,300
							CHROM.TRI	198,000		MOLYBDENUM	3,100	ZINC	4,008,000
3	13	CORE	06-Aug-88	NO	8240	EPA 8240	YES	1,1,1-TRICHLOROETHANE	130,000				
							TETRACHLOROETHENE	23,000					
3	13	CORE	06-Aug-88	NO	CN	EPA 9012	YES	CYANIDE	5,900				

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE ID.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD REQUESTED	ANALY- TICAL METHOD PERFORMED	WET PERFORMED	RESULTS		NOTE:	Methylene Chloride may be due to lab contamination. ND - NOT DETECTED (100) SPECIFIES DETECTION LIMIT			
							UQ/KG SOLID	(UQ/L LIQUID, SLUDGE—where noted)					
3 14	CORE	06-Aug-88	YES	CAM	CAM METALS	NO	ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)	NICKEL	4,400	
							ARSENIC	1,400	COBALT	1,100	SELENIUM	ND(100)	
							BARIUM	22,000	COPPER	8,100	SILVER	ND(200)	
							BERYLLIUM	ND(200)	LEAD	2,900	THALLIUM	ND(300)	
							CADMIUM	ND(200)	MERCURY	ND(20.00)	VANADIUM	4,000	
							CHROM.TRI	7,800	MOLYBDENUM	300	ZINC	13,000	
3 15	CORE	06-Aug-88	YES	CAM	CAM METALS	NO	ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)	NICKEL	2,400	
							ARSENIC	1,100	COBALT	400	SELENIUM	ND(100)	
							BARIUM	11,000	COPPER	2,700	SILVER	300	
							BERYLLIUM	ND(200)	LEAD	2,000	THALLIUM	ND(300)	
							CADMIUM	ND(200)	MERCURY	ND(20)	VANADIUM	1,900	
							CHROM.TRI	5,700	MOLYBDENUM	ND(300)	ZINC	7,500	
3 16	CORE	06-Aug-88	YES	CAM	CAM METALS	NO	ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)	NICKEL	2,800	
							ARSENIC	880	COBALT	600	SELENIUM	ND(100)	
							BARIUM	11,000	COPPER	2,800	SILVER	ND(200)	
							BERYLLIUM	ND(200)	LEAD	2,000	THALLIUM	ND(300)	
							CADMIUM	ND(200)	MERCURY	30	VANADIUM	2,000	
							CHROM.TRI	5,800	MOLYBDENUM	ND(400)	ZINC	7,800	
3 17	CORE	06-Aug-88	YES	CAM	CAM METALS	NO	ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)	NICKEL	3,200	
							ARSENIC	1,500	COBALT	1,100	SELENIUM	ND(100)	
							BARIUM	37,000	COPPER	13,000	SILVER	ND(200)	
							BERYLLIUM	ND(200)	LEAD	5,100	THALLIUM	ND(300)	
							CADMIUM	ND(200)	MERCURY	ND(20)	VANADIUM	4,100	
							CHROM.TRI	8,000	MOLYBDENUM	400	ZINC	21,000	
3 18	CORE	06-Aug-88	YES	CAM	CAM METALS	NO	ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)	NICKEL	2,500	
							ARSENIC	180	COBALT	700	SELENIUM	ND(100)	
							BARIUM	18,000	COPPER	2,800	SILVER	ND(200)	
							BERYLLIUM	ND(200)	LEAD	1,100	THALLIUM	ND(300)	
							CADMIUM	ND(200)	MERCURY	ND(20)	VANADIUM	3,800	
							CHROM.TRI	5,400	MOLYBDENUM	ND(400)	ZINC	5,000	
3 19	CORE	06-Aug-88	YES	CAM	CAM METALS	NO	ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)	NICKEL	3,000	
							ARSENIC	1,400	COBALT	800	SELENIUM	ND(100)	
							BARIUM	38,000	COPPER	12,000	SILVER	ND(200)	
							BERYLLIUM	ND(200)	LEAD	4,300	THALLIUM	ND(300)	

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE LD.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD REQUESTED	ANALY- TICAL METHOD PERFORMED	WET PERFORMED	RESULTS		NOTE:	Methylene Chloride may be due to lab contamination.	
							UO/KG SOLID	(U/L LIQUID, SLUDGE—where noted)		ND - NOT DETECTED	(100) SPECIFIES DETECTION LIMIT
							CADMIUM	ND(200)		MERCURY	ND(20)
							CHROM.TRI	7,300		MOLYBDENUM	M ND(400)
										VANADIUM	3,800
										ZINC	18,000
3 20	CORE	06-Aug-88	YES	CAM	CAM METALS	NO	ANTIMONY	ND(1000)		CHROM.HEX	ND(1000)
							ARSENIC	1,400		COBALT	1,600
							BARIUM	53,000		COPPER	23,000
							BERYLLIUM	ND(200)		LEAD	7,900
							CADMIUM	ND(200)		MERCURY	ND(20)
							CHROM.TRI	11,000		MOLYBDENUM	400
										NICKEL	7,700
										SELENIUM	ND(100)
										SILVER	ND(200)
										THALLIUM	ND(300)
										VANADIUM	6,900
										ZINC	28,000
B3 SI	SUMP MATERIAL	09-Aug-88	YES	8010	EPA 9040 EPA 8240	NO	1,1,1-TRICHLOROETHANE	1,900,000			
							TETRACHLOROETHENE	460,000			
							ND(25,000)				
B3 I2	SOLID	19-Aug-88	YES	8010	EPA 8010	NO	ND(50)				
B3 I5	SOLID	19-Aug-88	YES	8010	EPA 8010	NO	ND(50)				
3 19	SOLID	31-Aug-88	YES	CAM	CAM METALS	NO	ANTIMONY	2,000		CHROM.HEX	ND(1000)
							ARSENIC	3,000		COBALT	6,000
							BARIUM	5,000		COPPER	993,000
							BERYLLIUM	ND(50)		LEAD	302,000
							CADMIUM	19,000		MERCURY	60
							CHROM.TRI	887,000		MOLYBD.	4,100
										NICKEL	6,310,000
										SELENIUM	300
										SILVER	25,000
										THALLIUM	ND(300)
										VANADIUM	3,650
										ZINC	2,420,000
3 29	SOLID	31-Aug-88	YES	CAM	CAM METALS	NO	ANTIMONY	ND(10,000)		CHROM.HEX	180,000
							ARSENIC	4,100		COBALT	79,000
							BARIUM	190,000		COPPER	299,000
							BERYLLIUM	ND(50)		LEAD	745,000
							CADMIUM	ND(50)		MERCURY	1,300
							CHROM.TRI	2,480,000		MOLYBDENUM	16,000
										NICKEL	1,380,000
										SELENIUM	200
										SILVER	5,000
										THALLIUM	ND(300)
										VANADIUM	ND(500)
										ZINC	2,020,000
3 3	SOLID	31-Aug-88	YES	CAM	EPA 8010	NO	ANTIMONY	ND(1000)		CHROM.HEX	ND(1000)
							ARSENIC	800		COBALT	ND(50)
							BARIUM	190		COPPER	104,000
							BERYLLIUM	ND(50)		LEAD	900
							CADMIUM	70		MERCURY	60
										NICKEL	330
										SELENIUM	ND(100)
										SILVER	80
										THALLIUM	ND(300)
										VANADIUM	ND(50)

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE LD.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD REQUESTED	ANALY- TICAL METHOD PERFORMED	WET PERFORMED	RESULTS		NOTE:	Methylene Chloride may be due to lab contamination, ND - NOT DETECTED (100) SPECIES DETECTION LIMIT			
							UG/KG SOLID	(UG/L LIQUID, SLUDGE--where noted)					
							CHROM.TRI	810		MOLYBDENUM	ND(50)	ZINC	17,000
3	4	SOLID	31-Aug-88	YES	CAM	EPA 8010	NO	ANTIMONY	ND(100)	CHROM.HEX	ND(50)	NICKEL	410
							ARSENIC	8		COBALT	20	SELENIUM	ND(10)
							BARIUM	1,770		COPPER	7,170	SILVER	ND(20)
							BERYLLIUM	ND(20)		LEAD	180	THALLIUM	ND(100)
							CADMIUM	ND(20)		MERCURY	ND(1)	VANADIUM	ND(200)
							CHROM.TRI	590		MOLYBDENUM	ND(20)	ZINC	3,690
3	1	SOLID	31-Aug-88	YES	CN	EPA 8010	NO	CYANIDE ND(500)					
3	4	SOLID	31-Aug-88	YES	pH	EPA 8010	NO	--					
3	25	SOLID	31-Aug-88	YES	UNKNOWN	EPA 8010	NO	BARIUM TOTAL	3,000				
							CHROMIUM TOTAL	146,000					
							CHROMIUM, HEX	320					
							COPPER TOTAL	8,600					
							LEAD TOTAL	2,600					
							MERCURY TOTAL	ND(5)					
							NICKEL TOTAL	162,000					
							ZINC TOTAL	42,000					
3	3	SOLID	31-Aug-88	YES	UNKNOWN	EPA 8010	YES	COPPER 13,000 ug/L (STLC)					
3	21W	SOLVENT	08-Sep-88	YES	CAM	CAM METALS	NO	ANTIMONY	16,000	CHROM.HEX	ND(50)	NICKEL	160,000
							ARSENIC	2,600		COBALT	48,000	SELENIUM	300
							BARIUM	74,000		COPPER	1,500,000	SILVER	36,000
							BERYLLIUM	ND(700)		LEAD	150,000	THALLIUM	ND(300)
							CADMIUM	500,000		MERCURY	60	VANADIUM	4,700
							CHROM.TRI	980,000		MOLYBDENUM	48,000	ZINC	22,000,000
3	21W	SOLVENT	08-Sep-88	YES	8240	EPA 8240	NO	ACETONE	120,000				
							1,1-DICHLOROETHANE	14,000					
							1,1,1-TRICHLOROETHANE	160,000					
							TETRACHLOROETHYLENE	4,000					

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD REQUESTED	ANALY- TICAL METHOD PERFORMED	WET PERFORMED	RESULTS	NOTE:	Methylene Chloride may be due to lab contamination.				
				UG/KG SOLID (UG/L LIQUID, SLUDGE—where noted)	ND - NOT DETECTED (100) SPECIFIES DETECTION LIMIT								
3 21	SOLVENT	06-Sep-88	YES	CYANIDE/ pH	EPA 8012/ EPA 8040	--	CYANIDE pH	ND(500) 9.50 UNITS					
3 13	CORE	06-Sep-88	YES	UNKNOWN	METALS STLC	YES	CADMIUM COPPER LEAD MERCURY NICKEL ZINC	73,000 (ug/L) 32,000 " 6,400 " ND(5) " 19,000 " 7,700,000 "					
3 20	CORE	08-Sep-88	YES	UNKNOWN	EPA 8010 STLC	YES	LEAD	ND(200) (ug/L)					
3 23	CORE	29-Sep-88	YES	UNKNOWN	METALS EPA 8010 STLC	YES	CADMIUM COPPER LEAD ZINC	ND(200) (ug/L) 900 " ND(200) " 1,500 "					
3 21	CORE	29-Sep-88	YES	UNKNOWN	METALS STLC	YES	BARIUM LEAD	2,600 (ug/L) 400 (ug/L)					
3 22	CORE	29-Sep-88	YES	UNKNOWN	METALS STLC	YES	COPPER LEAD NICKEL	400 (ug/L) 200 (ug/L) 400 (ug/L)					
3 2	CORE	08-Sep-88	YES	UNKNOWN	METALS	YES	COPPER	4,500 (ug/L)					
BD3 S	SOLID	12-Sep-88	YES	CAM	METALS TTLC	NO	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM. TRI	ND(10000) 1,500 6,000 ND(500) 1,200 1,400,000	CHROM. HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(1000) 10,000 890,000 260,000 40 12,000	NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	600,000 ND(100) 5,000 ND(300) ND(500) 250,000	
BD3 S	SOLID	12-Sep-88	YES	CAM	METALS TTLC	NO	ANTIMONY ARSENIC	ND(10000) 800	CHROM. HEX COBALT	ND(1000) 1,000	NICKEL SELENIUM	13,000 ND(100)	

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE ID.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD REQUESTED	ANALY- TICAL METHOD PERFORMED	WET PERFORMED	RESULTS		NOTE:	Methylene Chloride may be due to lab contamination.			
							UG/KG SOLID	(UG/L LIQUID, SLUDGE—where noted)		ND - NOT DETECTED	(100) SPECIES DETECTION LIMIT		
							BARUM	89,000		COPPER	58,000	SILVER	6,900
							BERYLLIUM	ND(500)		LEAD	240,000	THALLIUM	ND(300)
							CADMIUM	ND(500)		MERCURY	540	VANADIUM	3,000
							CHROM.TRI	1,600,000		MOLYBDENUM	3,000	ZINC	35,000
BD3 PSS	SLUDGE	12-Sep-88	YES	CAM	METALS TTLC	NO	ANTIMONY	ND(10000)		CHROM.HEX	ND(1000)	NICKEL	140,000
							ARSENIC	1,300		COBALT	1,000	SELENIUM	ND(100)
							BARUM	88,000		COPPER	500,000	SILVER	2,100
							BERYLLIUM	ND(500)		LEAD	300,000	THALLIUM	ND(300)
							CADMIUM	15,000		MERCURY	50	VANADIUM	ND(500)
							CHROM.TRI	1,100,000		MOLYBDENUM	2,900	ZINC	6,000,000
BD3 PSN	SLUDGE	12-Sep-88	YES	CAM	METALS TTLC	NO	ANTIMONY	ND(10000)		CHROM.HEX	ND(1000)	NICKEL	170,000
							ARSENIC	1,000		COBALT	1,000	SELENIUM	ND(100)
							BARUM	87,000		COPPER	600,000	SILVER	2,700
							BERYLLIUM	ND(500)		LEAD	330,000	THALLIUM	ND(300)
							CADMIUM	8200		MERCURY	50	VANADIUM	ND(500)
							CHROM.TRI	1,700,000		MOLYBDENUM	3,000	ZINC	3,300,000
BD3 S	SOLID	12-Sep-88	YES	8010	EPA 8010	NO	1,1,1-TRICHLOROETHANE	2,100					
							TRICHLOROETHENE	400					
							TETRACHLOROETHENE	400					
							ND(100)						
BD3 5	SOLID	12-Sep-88	YES	8010	EPA 8010	NO	1,1,1-TRICHLOROETHANE	80,000					
							TRICHLOROETHENE	180,000					
							TETRACHLOROETHENE	50,000					
							ND(5000)						
BD3 PSS	SLUDGE	12-Sep-88	YES	8010	EPA 8010	NO	1,1-DICHLOROETHENE	22,000					
							1,1,1-TRICHLOROETHANE	84,000					
							TRICHLOROETHENE	2,000					
							TETRACHLOROETHENE	2,000					
							ND(1000)						
BD3 PSN	SLUDGE	12-Sep-88	YES	8010	EPA 8010	NO	1,1-DICHLOROETHENE	10,000					
							1,1,1-TRICHLOROETHANE	47,000					
							ND(1000)						

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE ID.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD	ANALY- TICAL METHOD	WET PERFORMED	RESULTS	NOTE:	Methylene Chloride may be due to lab contamination.			
				REQUESTED	PERFORMED		UG/KG SOLID (UG/L LIQUID, SLUDGE--where noted)		NO - NOT DETECTED (100) SPECIFIES DETECTION LIMIT			
3	23 CORE	28-Sep-88	YES	CAM	METALS TTLC	NO	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM.TRI	ND(1000) 730 31,000 ND(50) 1,100 7,400	CHROM.HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(1000) 2,980 140,000 8,400 380 100	NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	8,900 ND(100) 210 ND(300) 7,700 420,000
3	23 CORE	28-Sep-88	YES	8010	EPA 8010	NO	1,1,1-TRICHLOROETHANE TRICHLOROETHENE TETRACHLOROETHENE ND(50)	1,900 120 800				
3	24 CORE	28-Sep-88	YES	CAM	METALS TTLC	NO	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM.TRI	ND(1000) 270 15,000 ND(50) 70 2,800	CHROM.HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(3000) 650 1,800 920 90 ND(50)	NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	2,500 ND(100) ND(50) ND(300) 3,100 4,300
3	24 CORE	28-Sep-88	YES	8010	EPA 8010	NO	1,1,1-TRICHLOROETHANE TRICHLOROETHENE ND(50)	800 80				
3	21 CORE	28-Sep-88	YES	CAM	METALS TTLC	NO	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM.TRI	ND(1000) 1,900 120,000 ND(50) 400 9,800	CHROM.HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(1000) 850 21,000 120,000 60 100	NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	9,300 ND(100) 60 ND(300) 3,400 91,000
3	21 CORE	28-Sep-88	YES	8010	EPA 8010	NO	1,1,1-TRICHLOROETHANE TETRACHLOROETHENE ND(50)	450 150				
3	22 CORE	28-Sep-88	YES	CAM	METALS TTLC	NO	ANTIMONY ARSENIC	ND(1000) 1,700	CHROM.HEX COBALT	ND(1000) 890	NICKEL SELENIUM	35,000 ND(100)

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL		WET PERFORMED	RESULTS		NOTE:	Methylene Chloride may be due to lab contamination. ND - NOT DETECTED (100) SPECIFIES DETECTION LIMIT			
				METHOD REQUESTED	METHOD PERFORMED		UG/KG SOLID (UG/L LIQUID, SLUDGE—where noted)						
							BARIUM	80,000		COPPER	85,000	SILVER	230
							BERYLLIUM	ND(50)		LEAD	92,000	THALLIUM	ND(300)
							CADMIUM	700		MERCURY	20	VANADIUM	2,900
							CHROM.TRI	22,000		MOLYBDENUM	100	ZINC	140,000
3	22	CORE	28-Sep-88	YES	8010	EPA 8010	NO	METHYLENE CHLORIDE	200				
							1,1-DICHLOROETHANE	150					
							1,1,1-TRICHLOROETHANE	2,300					
							TRICHLOROETHENE	150					
							TETRACHLOROETHENE	400					
							ND(50)						
3	6	CORE	28-Sep-88	YES	CAM	METALS TTLC	NO	ANTIMONY	ND(1000)	CHROM.HEX	ND(4000)	NICKEL	3,200
							ARSENIC	1,300		COBALT	580	SELENIUM	ND(100)
							BARIUM	18,000		COPPER	2,900	SILVER	ND(50)
							BERYLLIUM	ND(50)		LEAD	1,300	THALLIUM	ND(300)
							CADMIUM	80		MERCURY	130	VANADIUM	2,300
							CHROM.TRI	3,600		MOLYBDENUM	70	ZINC	8,200
3	6	CORE	28-Sep-88	YES	8010	EPA 8010	NO	1,1-DICHLOROETHENE	130				
							1,1,1-TRICHLOROETHANE	550					
							TRICHLOROETHENE	500					
							ND(50)						
3	6	CORE	28-Sep-88	YES	CAM	METALS TTLC	NO	ANTIMONY	ND(1000)	CHROM.HEX	ND(5000)	NICKEL	4,500
							ARSENIC	1,700		COBALT	820	SELENIUM	ND(100)
							BARIUM	21,000		COPPER	4,100	SILVER	ND(50)
							BERYLLIUM	ND(50)		LEAD	1,800	THALLIUM	ND(300)
							CADMIUM	130		MERCURY	20	VANADIUM	3,400
							CHROM.TRI	4,500		MOLYBDENUM	170	ZINC	9,000
3	6	CORE	28-Sep-88	YES	8010	EPA 8010	NO	1,1,1-TRICHLOROETHANE	100,000				
							TRICHLOROETHENE	130,000					
							ND(2500)						
3	20	CORE	28-Sep-88	YES	CAM	METALS TTLC	NO	ANTIMONY	21,000	CHROM.HEX	2,000	NICKEL	ND(100)
							ARSENIC	230		COBALT	11,000	SELENIUM	ND(100)
							BARIUM	12,000		COPPER	3,200	SILVER	1,100

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD REQUESTED	ANALY- TICAL METHOD PERFORMED	WET PERFORMED	RESULTS UG/KG SOLID (UG/L LIQUID, SLUDGE—where noted)	NOTE: Methylene Chloride may be due to lab contamination. ND - NOT DETECTED (100) SPECIFIES DETECTION LIMIT				
							BERYLLIUM	ND(50)	LEAD	13,000	THALLIUM	ND(300)
							CADMIUM	ND(50)	MERCURY	20	VANADIUM	ND(50)
							CHROM.TRI	250,000	MOLYBDENUM	190	ZINC	2,600
3 29	CORE	28-Sep-88	YES	8010	EPA 8010	NO	ND(50)					
3 28	CORE	28-Sep-88	YES	CAM	METALS TTLC	NO	ANTIMONY	5,000	CHROM.HEX	8,000	NICKEL	3,400
							ARSENIC	1,100	COBALT	700	SELENIUM	ND(100)
							BARIUM	23,000	COPPER	17,000	SILVER	540
							BERYLLIUM	ND(50)	LEAD	35,000	THALLIUM	ND(300)
							CADMIUM	130	MERCURY	140	VANADIUM	2,300
							CHROM.TRI	440,000	MOLYBDENUM	ND(50)	ZINC	18,000
3 26	CORE	28-Sep-88	YES	8010	EPA 8010	NO	ND(50)					
3 25	CORE	28-Sep-88	YES	CAM	METALS TTLC	NO	ANTIMONY	ND(1000)	CHROM.HEX	64,000	NICKEL	3,200
							ARSENIC	620	COBALT	490	SELENIUM	ND(100)
							BARIUM	14,000	COPPER	9,500	SILVER	520
							BERYLLIUM	ND(50)	LEAD	22,000	THALLIUM	ND(300)
							CADMIUM	ND(50)	MERCURY	80	VANADIUM	ND(50)
							CHROM.TRI	2,300,000	MOLYBDENUM	190	ZINC	12,000
3 25	CORE	28-Sep-88	YES	8010	EPA 8010	NO	1,1,1-TRICHLOROETHANE ND(50)	60				
3 26	CORE	28-Sep-88	YES	CAM	METALS TTLC	NO	ANTIMONY	5,000	CHROM.HEX	ND(1000)	NICKEL	4,800
							ARSENIC	870	COBALT	800	SELENIUM	ND(100)
							BARIUM	20,000	COPPER	11,000	SILVER	350
							BERYLLIUM	ND(50)	LEAD	38,000	THALLIUM	ND(300)
							CADMIUM	1,700	MERCURY	180	VANADIUM	1,800
							CHROM.TRI	610,000	MOLYBDENUM	90	ZINC	26,000
3 26	CORE	28-Sep-88	YES	8010	EPA 8010	NO	1,1,1-TRICHLOROETHANE TRICHLOROETHENE ND(50)	60 200				
3 27	CORE	28-Sep-88	YES	CAM	METALS	NO	ANTIMONY	ND(1000)	CHROM.HEX	ND(5000)	NICKEL	4,500

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE ID.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD	ANALY- TICAL METHOD	WET PERFORMED	RESULTS	NOTE:	Methylene Chloride may be due to lab contamination.			
				REQUESTED	PERFORMED		UG/KG SOLID (U/L LIQUID, SLUDGE—where noted)		NO - NOT DETECTED (100) SPECIES DETECTION LIMIT			
					TTL		ARSENIC	320	COBALT	1,100	SELENIUM	ND(100)
							BARIIUM	150,000	COPPER	8,800	SILVER	130
							BERYLLIUM	ND(50)	LEAD	3,600	THALLIUM	ND(300)
							CADMIUM	1,000	MERCURY	20	VANADIUM	3,700
							CHROM. TRI	4,900	MOLYBDENUM	110	ZINC	1,900,000
3	27	CORE	28-Sep-88	YES	8010	EPA 8010	NO	1,1,1-TRICHLOROETHANE	300			
								TRICHLOROETHENE	1,000			
								ND(50)				
3	27	CORE	28-Sep-88	YES	CYANIDE	9012	--	CYANIDE	2,800			
3	34	0 SOLID	03-Oct-88	YES	UNKNOWN	STLC	YES	BARIIUM	5,900 (ug/L)	COPPER	2,900 (ug/L)	
								CADMIUM	ND(200) "	LEAD	700 "	
								CHROM. TRI	35,000 "	NICKEL	700 "	
								CHROM. HEX	17,000 "	VANADIUM	ND(200) "	
3	34	2 SOLID	03-Oct-88	YES	UNKNOWN	STLC	YES	BARIIUM	5,000 (ug/L)	COPPER	3,000 (ug/L)	
								CHROM. TRI	280,000 "	LEAD	300 "	
								CHROM. HEX	55,000 "	NICKEL	400 "	
3	35	0 SOLID	03-Oct-88	YES	UNKNOWN	STLC	YES	BARIIUM	5,900 (ug/L)			
								COPPER	2,800 "			
								LEAD	2,300 "			
3	35	2 SOLID	03-Oct-88	YES	UNKNOWN	STLC	YES	BARIIUM	7,000 (ug/L)			
								COPPER	4,100 "			
								LEAD	500 "			
								SILVER	ND(200) "			
3	32	0 SOLID	03-Oct-88	YES	UNKNOWN	EPA 8010 STLC	YES	CHROMIUM	20,000 (ug/L)			
								LEAD	4,100 "			
3	32	2 SOLID	03-Oct-88	YES	UNKNOWN	STLC	YES	BARIIUM	7,000 (ug/L)			
								CHROMIUM	130,000 "			

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE ID.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD REQUESTED	ANALY- TICAL METHOD PERFORMED	WET PERFORMED	RESULTS	NOTE:	Methylene Chloride may be due to lab contamination.				
							UO/KG SOLID (UG/L LIQUID, SLUDGE—where noted)		NO - NOT DETECTED (100) SPECIFIES DETECTION LIMIT				
							LEAD	2,900	*				
							NICKEL	400	*				
							VANADIUM	ND(200)	*				
3	31 0	SOLID	03-Oct-88	YES	UNKNOWN	STLC	YES	ARSENIC	60 (ug/L)				
							BARIUM	8,800	*				
							LEAD	1,400	*				
							ZINC	20,000	*				
3	31 2	SOLID	03-Oct-88	YES	UNKNOWN	STLC	YES	BARIUM	7,300 (ug/L)				
3	31 5	SOLID	03-Oct-88	YES	UNKNOWN	STLC	YES	BARIUM	5,600 (ug/L)				
3	33 0	SOLID	03-Oct-88	YES	UNKNOWN	STLC	YES	CADMIUM	500 (ug/L)	COPPER	3,700 (ug/L)		
							CHROM.TRI	23,000	*	LEAD	1,100 *		
							CHROM.HEX	3,000	*	NICKEL	600 *		
3	33 2	SOLID	03-Oct-88	YES	UNKNOWN	STLC	YES	BARIUM	8,900 (ug/L)				
							CADMIUM	1,000	*				
							COPPER	14,000	*				
3	33 5	SOLID	03-Oct-88	YES	UNKNOWN	STLC	YES	BARIUM	5,400 (ug/L)				
							CADMIUM	2,200	*				
							LEAD	ND(200)	*				
							NICKEL	900	*				
							VANADIUM	200	*				
W3 1	LIQUID	03-Oct-88	YES	8010	METALS	NO	ANTIMONY	ND(100) (ug/L)	CHROM.HEX	(INSUFF.DATA)	NICKEL	4,370 (ug/L)	
							ARSENIC	9 (ug/L)	COBALT	30 (ug/L)	SELENIUM	ND(10) (ug/L)	
							BARIUM	330	*	COPPER	680	SILVER	ND(20) *
							BERYLLIUM	ND(20)	*	LEAD	320	THALLIUM	ND(100) *
							CADMIUM	40	*	MERCURY	ND(1)	VANADIUM	70 *
							CHROM.TRI	380	*	MOLYBDENUM	20	ZINC	2,300 *
W3 2	LIQUID	03-Oct-88	YES	CAM	METALS	NO	ANTIMONY	ND(100) (ug/L)	CHROM.HEX	ND(50) (ug/L)	NICKEL	770 (ug/L)	
							ARSENIC	ND(5)	*	COBALT	ND(20)	SELENIUM	ND(10) *

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD	ANALY- TICAL METHOD	WET PERFORMED	RESULTS	NOTE:	Methylene Chloride may be due to lab contamination. ND - NOT DETECTED			
				REQUESTED	PERFORMED		UG/KG SOLID (UG/L LIQUID, SLUDGE--where noted)		(100) SPECIES DETECTION LIMIT			
							BARIUM	80 *	COPPER	180 *	SILVER	ND(20) *
							BERYLLIUM	ND(20) *	LEAD	20 *	THALLIUM	ND(100) *
							CADMIUM	ND(20) *	MERCURY	ND(1) *	VANADIUM	ND(20) *
							CHROM.TRI	90 *	MOLYBDENUM	ND(20) *	ZINC	280 *
W3 2	LIQUID	03-Oct-88	YES	8010	EPA 801	NO	METHYLENE CHLORIDE	3 (ug/L)				
							BROMODICHLOROMETHANE	1 *				
							DIBROMOCHLOROMETHANE	4 *				
							BROMOFORM	3 *				
							ND(1)					
W3 3	LIQUID	03-Oct-88	YES	CAM	METALS	NO	ANTIMONY	ND(100) (ug/L)	CHROM.HEX	ND(50) (ug/L)	NICKEL	1,110 (ug/L)
							ARSENIC	7 *	COBALT	ND(20) *	SELENIUM	ND(10) *
							BARIUM	420 *	COPPER	300 *	SILVER	ND(20) *
							BERYLLIUM	ND(20) *	LEAD	90 *	THALLIUM	ND(100) *
							CADMIUM	30 *	MERCURY	ND(1) *	VANADIUM	ND(20) *
							CHROM.TRI	170 *	MOLYBDENUM	ND(20) *	ZINC	1,100 *
W3 3	LIQUID	03-Oct-88	YES	8010	801	NO	METHYLENE CHLORIDE	3 (ug/L)	DIBROMOCHLOROMETHANE		8 (ug/L)	
							1,1-DICHLOROETHANE	1 *	BROMOFORM		3 *	
							TRANS-1,2-DICHLOROETHE	3 *	TETRACHLOROETHENE		8 *	
							1,1,1-TRICHLOROETHANE	5 *				
							BROMODICHLOROMETHANE	2 *				
							ND(1)					
3 34 0	SOLID	03-Oct-88	YES	CAM	METALS	NO	ANTIMONY	11,000	CHROM.HEX	180,000	NICKEL	32,000
							ARSENIC	1,800	COBALT	10,000	SELENIUM	ND(100)
							BARIUM	150,000	COPPER	310,000	SILVER	900
							BERYLLIUM	ND(300)	LEAD	22,000	THALLIUM	ND(300)
							CADMIUM	2,500	MERCURY	80	VANADIUM	38,000
							CHROM.TRI	660,000	MOLYBDENUM	300	ZINC	110,000
3 34 0	SOLID	03-Oct-88	YES	8010	8010	NO	1,1,1-TRICHLOROETHANE	90				
							TETRACHLOROETHENE	150				
							ND(50)					
3 34 2	SOLID	03-Oct-88	YES	CAM	METALS	NO	ANTIMONY	ND(10000)	CHROM.HEX	410,000	NICKEL	43,000
							ARSENIC	1,500	COBALT	14,000	SELENIUM	ND(100)

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD	ANALY- TICAL METHOD	WET PERFORMED	RESULTS		NOTE:	Methylene Chloride may be due to lab contamination.				
				REQUESTED	PERFORMED		UG/KG SOLID	(UG/L LIQUID, SLUDGE—where noted)		ND - NOT DETECTED	(100) SPECIES DETECTION LIMIT			
								BARIUM	189,000		COPPER	130,000	SILVER	ND(500)
								BERYLLIUM	ND(500)		LEAD	14,000	THALLIUM	ND(300)
								CADMIUM	ND(500)		MERCURY	30	VANADIUM	18,000
								CHROM.TRI	10,000,000		MOLYBDENUM	1,500	ZINC	94,000
3	34	2	SOLID	03-Oct-88	YES	8010	8010	NO	ND(50)					
							CAM							
							METALS							
3	35	0	SOLID	03-Oct-88	YES	CAM		NO	ANTIMONY	2,000	CHROM.HEX	ND(1000)	NICKEL	16,000
									ARSENIC	1,700	COBALT	4,100	SELENIUM	ND(100)
									BARIUM	110,000	COPPER	29,000	SILVER	450
									BERYLLIUM	ND(50)	LEAD	12,000	THALLIUM	ND(300)
									CADMIUM	700	MERCURY	120	VANADIUM	20,000
									CHROM.TRI	92,000	MOLYBDENUM	180	ZINC	38,000
3	35	0	SOLID	03-Oct-88	YES	8010	8010	NO	1,1,1-TRICHLOROETHANE	200				
									TETRACHLOROETHENE	250				
									ND(50)					
							CAM							
							METALS							
3	35	2	SOLID	03-Oct-88	YES	CAM		NO	ANTIMONY	1,000	CHROM.HEX	ND(1000)	NICKEL	18,000
									ARSENIC	1,200	COBALT	6,700	SELENIUM	ND(100)
									BARIUM	150,000	COPPER	73,000	SILVER	7,200
									BERYLLIUM	ND(50)	LEAD	7,100	THALLIUM	ND(300)
									CADMIUM	700	MERCURY	80	VANADIUM	23,000
									CHROM.TRI	48,000	MOLYBDENUM	140	ZINC	81,000
							EPA							
							8010							
3	35	2	SOLID	03-Oct-88	YES	8010		NO	TRANS-1,2-DICHLOROETHE	100				
									1,1,1-TRICHLOROETHANE	1,800				
									TRANS-1,3-DICHLOROPROP	100				
									TETRACHLOROETHENE	2,000				
									ND(50)					
							CAM							
							METALS							
3	32	0	SOLID	03-Oct-88	YES	CAM		NO	ANTIMONY	ND(10000)	CHROM.HEX	ND(1000)	NICKEL	20,000
									ARSENIC	1,200	COBALT	2,000	SELENIUM	ND(100)
									BARIUM	83,000	COPPER	25,000	SILVER	1,700
									BERYLLIUM	ND(500)	LEAD	100,000	THALLIUM	ND(300)
									CADMIUM	ND(500)	MERCURY	ND(20)	VANADIUM	ND(500)
									CHROM.TRI	3,900,000	MOLYBDENUM	8,200	ZINC	77,000

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE ID.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD REQUESTED	ANALY- TICAL METHOD PERFORMED	WET PERFORMED	RESULTS UOM/KG SOLID (U/L LIQUID, SLUDGE—where noted)	NOTE:	Methylene Chloride may be due to lab contamination. ND - NOT DETECTED (100) SPECIFICS DETECTION LIMIT					
3	32	0	SOLID	03-Oct-88	YES	8010	EPA 8010	NO	1,1,1-TRICHLOROETHANE TETRACHLOROETHENE ND(50)	750 400				
3	32	2	SOLID	03-Oct-88	YES	CAM	CAM METALS	NO	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM. TRI	ND(10000) 1,700 200,000 ND(500) ND(500) 4,200,000	CHROM. HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(1000) 6,000 25,000 72,000 ND(20) 2,500	NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	33,000 ND(100) 900 ND(300) 27,000 60,000
3	32	2	SOLID	03-Oct-88	YES	8010	EPA 8010	NO	1,1,1-TRICHLOROETHANE ND(50)	100				
3	31	0	SOLID	03-Oct-88	YES	CAM	CAM METALS	NO	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM. TRI	2,000 6,300 200,000 ND(50) 2,900 130,000	CHROM. HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	(INSUFF. SAMPLE) 6,200 13,000 11,000 ND(20) 50	NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	16,000 ND(100) 3,300 ND(300) 20,000 590,000
3	31	0	SOLID	03-Oct-88	YES	8240	EPA 8240	NO	2-BUTANONE 1,1,1-TRICHLOROETHANE TETRACHLOROETHENE	290,000 830,000 130,000				
3	31	2	SOLID	03-Oct-88	YES	CAM	CAM METALS	NO	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM. TRI	1,000 1,000 170,000 ND(50) 500 15,000	CHROM. HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(1000) 6,300 16,000 4,000 ND(20) ND(50)	NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	17,000 ND(100) 110 ND(300) 22,000 33,000
3	31	2	SOLID	03-Oct-88	YES	8240	EPA 8240	NO	METHYLENE CHLORIDE	18				
3	31	8	SOLID	03-Oct-88	YES	CAM	CAM METALS	NO	ANTIMONY ARSENIC	ND(1000) 950	CHROM. HEX COBALT	INSUFF. SAMPLE 6,200	NICKEL SELENIUM	14,000 ND(100)

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL		WET PERFORMED	RESULTS		NOTE:	Methylene Chloride may be due to lab contamination, ND - NOT DETECTED (100) SPECIFIES DETECTION LIMIT			
				METHOD REQUESTED	METHOD PERFORMED		UO/KG SOLID (U/L LIQUID, SLUDGE--where noted)						
							BARIUM	120,000		COPPER	24,000	SILVER	ND(50)
							BERYLLIUM	ND(50)		LEAD	4,000	THALLIUM	ND(300)
							CADMIUM	800		MERCURY	ND(20)	VANADIUM	25,000
							CHROM. TRI	14,000		MOLYBDENUM	ND(50)	ZINC	33,000
3 33 2	SOLID	03-Oct-88	YES	CAM	CAM METALS	NO	ANTIMONY	2,000		CHROM. HEX	ND(1000)	NICKEL	19,000
							ARSENIC	1,300		COBALT	6,700	SELENIUM	ND(100)
							BARIUM	180,000		COPPER	220,000	SILVER	180
							BERYLLIUM	ND(50)		LEAD	4,600	THALLIUM	ND(300)
							CADMIUM	5,200		MERCURY	80	VANADIUM	22,000
							CHROM. TRI	130,000		MOLYBDENUM	ND(50)	ZINC	150,000
3 33 2	SOLID	03-Oct-88	YES	8010	EPA 8010	NO	1,1,1-TRICHLOROETHANE	55					
							ND(50)						
3 33 5	SOLID	03-Oct-88	YES	CAM	CAM METALS	NO	ANTIMONY	2,000		CHROM. HEX	ND(1000)	NICKEL	23,000
							ARSENIC	1,200		COBALT	7,900	SELENIUM	ND(100)
							BARIUM	110,000		COPPER	17,000	SILVER	ND(300)
							BERYLLIUM	ND(300)		LEAD	8,200	THALLIUM	ND(300)
							CADMIUM	15,000		MERCURY	ND(20)	VANADIUM	34,000
							CHROM. TRI	83,000		MOLYBDENUM	ND(300)	ZINC	42,000
3 33 6	SOLID	03-Oct-88	YES	8010	EPA 8010	NO	ND(50)						
3 31 6	SOLID	03-Oct-88	YES	CN	EPA 9012 CYANIDE	--	CYANIDE	ND(500)					
3 31 2	SOLID	03-Oct-88	YES	CN	EPA 9012	--	CYANIDE	ND(500)					
3 31 6	SOLID	03-Oct-88	YES	8240	EPA 8240	NO	CYANIDE	ND(500)					
3 31 6	SOLID	03-Oct-88	YES	CAM	CAM METALS	NO	METHYLENE CHLORIDE	17,000					
3 33 S	SOLID	03-Oct-88	YES	CAM	CAM METALS	NO	ANTIMONY	ND(10000)		CHROM. HEX	8,000	NICKEL	39,000
							ARSENIC	1,000		COBALT	7,000	SELENIUM	ND(100)
							BARIUM	80,000		COPPER	140,000	SILVER	3,000
							BERYLLIUM	ND(800)		LEAD	34,000	THALLIUM	ND(300)
							CADMIUM	8,800		MERCURY	30	VANADIUM	23,000

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE ID.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD	ANALY- TICAL METHOD	WET PERFORMED	RESULTS	NOTE:	Methylene Chloride may be due to lab contamination.					
				REQUESTED	PERFORMED		UG/KG SOLID (U/L LIQUID, SLUDGE—where noted)		NO - NOT DETECTED (100) SPECIFIES DETECTION LIMIT					
							CHROM.TRI	1,600,000		MOLYBDENUM	1,200		ZINC	160,000
3 33 9	SOLID	03-Oct-88	YES	8010	EPA 8010	NO	1,1,1-TRICHLOROETHANE TETRACHLOROETHENE ND(50)	150 150						
3 35	CORE	17-Oct-88	YES	PH	EPA 9040 PH	--	pH	11.70 UNITS						
3 36	SOLID	17-Oct-88	YES	PH	EPA 9040 PH	--	pH	8.60 UNITS						
3 37	SOLID	17-Oct-88	YES	PH	EPA 9040 PH	--	pH	8.70 UNITS						
3 36	SOLID	17-Oct-88	YES	CAM METALS	CAM METALS	NO	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM.TRI	ND(1000) 820 43,000 ND(50) 400 8,400		CHROM.HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(1000) 2,900 7,600 12,000 80 ND(50)		NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	14,000 ND(100) 70 ND(300) 14,000 20,000
3 37	SOLID	17-Oct-88	YES	CAM METALS	CAM METALS	NO	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM.TRI	ND(1000) 980 97,000 ND(50) 700 14,000		CHROM.HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(1000) 4,400 22,000 7,700 40 ND(50)		NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	29,000 ND(100) ND(50) ND(300) 17,000 120,000
3 35	CORE	17-Oct-88	YES	8010	EPA 8010	NO	ND(50)							
3 36	SOLID	17-Oct-88	YES	8010	EPA 8010	NO	ND(50)							
3 37	SOLID	17-Oct-88	YES	8010	EPA 8010	NO	TRICHLOROETHENE ND(50)	1000						
3 47	SOLID	03-Nov-88	YES	CAM	CAM METALS	NO	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM.TRI	ND(1000) 600 48,000 ND(50) 240 18,000		CHROM.HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	1,500 2,400 10,000 2,300 ND(20) ND(50)		NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	4,700 ND(100) ND(50) ND(300) 14,000 14,000

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD REQUESTED	ANALY- TICAL METHOD PERFORMED	WET PERFORMED	RESULTS UG/KG SOLID (UG/L LIQUID, SLUDGE--where noted)	NOTE:	Methylene Chloride may be due to lab contamination. ND - NOT DETECTED (100) SPECIES DETECTION LIMIT					
3 47	SOLID	03-Nov-88	YES	8010	EPA 8010	NO	ND(50)							
3 47	SOLID	03-Nov-88	YES	PH	EPA 8040 PH	--	pH	4.40 UNITS						
3 48	SOLID	03-Nov-88	YES	PH	EPA 8040 PH	--	pH	6.90 UNITS						
3 121 15	SOLID	02-Dec-88	YES	CAM	CAM METALS	NO	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM. TRI	ND(1000) 700 34,000 ND(50) 700 7,700	CHROM. HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(1000) 3,400 12,000 1,600 ND(20) ND(50)	NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	5,000 ND(100) ND(50) ND(300) 21,000 23,000		
3 121 20	SOLID	02-Dec-88	YES	CAM	CAM METALS	NO	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM. TRI	ND(1000) 1,000 61,000 ND(50) 720 9,100	CHROM. HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(1000) 4,800 12,000 2,600 ND(20) ND(50)	NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	7,000 ND(100) ND(50) ND(300) 21,000 34,000		
3 121 25	SOLID	02-Dec-88	YES	CAM	CAM METALS	NO	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM. TRI	ND(1000) 700 88,000 ND(50) 800 8,200	CHROM. HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(1000) 4,100 17,000 2,400 ND(200) ND(50)	NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	5,000 ND(100) ND(50) ND(300) 20,000 29,000		
3 120 1	SOLID	02-Dec-88	YES	CAM	CAM METALS	NO	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROM. TRI	ND(1000) 1,300 98,000 ND(50) 1,800 31,000	CHROM. HEX COBALT COPPER LEAD MERCURY MOLYBDENUM	ND(1000) 6,200 88,000 6,400 ND(20) 110	NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	14,000 ND(100) ND(50) ND(300) 24,000 68,000		
3 120 6	SOLID	02-Dec-88	YES	CAM	CAM METALS	NO	ANTIMONY ARSENIC	ND(1000) 1,000	CHROM. HEX COBALT	ND(1000) 4,300	NICKEL SELENIUM	5,400 ND(100)		

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD REQUESTED	ANALY- TICAL METHOD PERFORMED	WET PERFORMED	RESULTS		NOTE:	Methylene Chloride may be due to lab contamination. NO - NOT DETECTED (100) SPECIFIES DETECTION LIMIT			
							UG/KG SOLID	(UG/L LIQUID, SLUDGE—where noted)					
							BARIUM	65,000		COPPER	8,600	SILVER	ND(50)
							BERYLLIUM	ND(50)		LEAD	2,500	THALLIUM	ND(300)
							CADMIUM	330		MERCURY	ND(20)	VANADIUM	22,000
							CHROM.TRI	9,600		MOLYBDENUM	ND(50)	ZINC	20,000
3	120 10	SOLID	02-Dec-88	YES	CAM	CAM METALS	NO	ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)	NICKEL	3,800
							ARSENIC	700		COBALT	3,200	SELENIUM	ND(100)
							BARIUM	44,000		COPPER	6,800	SILVER	ND(50)
							BERYLLIUM	ND(50)		LEAD	1,600	THALLIUM	ND(300)
							CADMIUM	240		MERCURY	ND(20)	VANADIUM	15,000
							CHROM.TRI	6,400		MOLYBDENUM	ND(50)	ZINC	15,000
3	120 15	SOLID	02-Dec-88	YES	CAM	CAM METALS	NO	ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)	NICKEL	4,800
							ARSENIC	800		COBALT	3,600	SELENIUM	ND(100)
							BARIUM	45,000		COPPER	12,000	SILVER	ND(50)
							BERYLLIUM	ND(50)		LEAD	2,100	THALLIUM	ND(300)
							CADMIUM	460		MERCURY	110	VANADIUM	17,000
							CHROM.TRI	8,600		MOLYBDENUM	ND(50)	ZINC	19,000
3	48	SOLID	03-Nov-88	YES	CAM	CAM METALS	NO	ANTIMONY	4,000	CHROM.HEX	ND(1000)	NICKEL	4,000
							ARSENIC	1,100		COBALT	700	SELENIUM	ND(100)
							BARIUM	87,000		COPPER	13,000	SILVER	1,200
							BERYLLIUM	ND(50)		LEAD	170,000	THALLIUM	ND(300)
							CADMIUM	100		MERCURY	40	VANADIUM	7,600
							CHROM.TRI	200,000		MOLYBDENUM	2,400	ZINC	4,900
3	48	SOLID	03-Nov-88	YES	8010	EPA 8010	NO	TETRACHLOROETHENE	290,000				
							ND(5000)						
3	120 20	SOLID	02-Dec-88	YES	CAM	CAM METALS	NO	ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)	NICKEL	7,300
							ARSENIC	1,100		COBALT	5,800	SELENIUM	ND(100)
							BARIUM	76,000		COPPER	14,000	SILVER	ND(50)
							BERYLLIUM	ND(50)		LEAD	3,500	THALLIUM	ND(300)
							CADMIUM	3,400		MERCURY	ND(200)	VANADIUM	23,000
							CHROM.TRI	11,000		MOLYBDENUM	ND(50)	ZINC	46,000
3	120 26	SOLID	02-Dec-88	YES	CAM	CAM METALS	NO	ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)	NICKEL	9,600
							ARSENIC	1,300		COBALT	6,300	SELENIUM	ND(100)

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD REQUESTED	ANALY- TICAL METHOD PERFORMED	WET PERFORMED	RESULTS		NOTE:	Methylene Chloride may be due to lab contamination, ND - NOT DETECTED (100) SPECIFIES DETECTION LIMIT			
							UO/KG SOLID	(U/L LIQUID, SLUDGE--where noted)					
							BARUM	89,000		COPPER	9,100	SILVER	ND(50)
							BERYLLIUM	ND(50)		LEAD	4,000	THALLIUM	ND(300)
							CADMIUM	12,000		MERCURY	ND(20)	VANADIUM	24,000
							CHROM.TRI	13,000		MOLYBDENUM	50	ZINC	92,000
3	121	8	SOLID	02-Dec-88	YES	CAM	CAM METALS	NO		ANTIMONY	1,000	CHROM.HEX	ND(1000)
							ARSENIC	1,600		COBALT	7,000	NICKEL	10,000
							BARUM	140,000		COPPER	18,000	SELENIUM	ND(100)
							BERYLLIUM	ND(50)		LEAD	8,000	SILVER	ND(50)
							CADMIUM	600		MERCURY	ND(20)	THALLIUM	ND(300)
							CHROM.TRI	17,000		MOLYBDENUM	ND(50)	VANADIUM	28,000
										ZINC		37,000	
3	121	8	SOLID	02-Dec-88	YES	CAM	CAM METALS	NO		ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)
							ARSENIC	600		COBALT	3,200	NICKEL	3,800
							BARUM	37,000		COPPER	7,700	SELENIUM	ND(100)
							BERYLLIUM	ND(50)		LEAD	2,100	SILVER	ND(50)
							CADMIUM	280		MERCURY	90	THALLIUM	ND(300)
							CHROM.TRI	6,300		MOLYBDENUM	ND(50)	VANADIUM	13,000
										ZINC		17,000	
3	121	10	SOLID	02-Dec-88	YES	CAM	CAM METALS	NO		ANTIMONY	ND(1000)	CHROM.HEX	ND(1000)
							ARSENIC	700		COBALT	3,800	NICKEL	7,400
							BARUM	40,000		COPPER	7,200	SELENIUM	ND(100)
							BERYLLIUM	ND(50)		LEAD	1,800	SILVER	ND(50)
							CADMIUM	430		MERCURY	ND(20)	THALLIUM	ND(300)
							CHROM.TRI	6,500		MOLYBDENUM	ND(50)	VANADIUM	16,000
										ZINC		38,000	
3	121	15	SOLID	02-Dec-88	YES	8010	EPA 8010	NO		ND(50)			
3	121	20	SOLID	02-Dec-88	YES	8010	EPA 8010	NO		ND(50)			
3	121	25	SOLID	02-Dec-88	YES	8010	EPA 8010	NO		ND(50)			
3	120	1	SOLID	02-Dec-88	YES	8010	EPA 8010	NO		ND(50)			
3	120	8	SOLID	02-Dec-88	YES	8010	EPA 8010	NO		ND(50)			

A. L. BURKE--DECEMBER 1988--ANALYTICAL RESULTS

SAMPLE I.D.	MEDIUM	COLLECTION DATE	HOLDING TIMES MET	ANALY- TICAL METHOD	ANALY- TICAL METHOD	WET PERFORMED	RESULTS	NOTE:	Methylene Chloride may be due to lab contamination. NO - NOT DETECTED (100) SPECIFIES DETECTION LIMIT
				REQUESTED	PERFORMED		UO/KG SOLID (UG/L LIQUID, SLUDGE—where noted)		
3 120 10	SOLID	02-Dec-88	YES	8010	EPA 8010	NO	ND(50)		
3 120 15	SOLID	02-Dec-88	YES	8010	EPA 8010	NO	ND(50)		
3 120 20	SOLID	02-Dec-88	YES	8010	EPA 8010	NO	ND(50)		
3 120 25	SOLID	02-Dec-88	YES	8010	EPA 8010	NO	ND(50)		
3 121 5	SOLID	02-Dec-88	YES	8010	EPA 8010	NO	ND(50)		
3 121 6	SOLID	02-Dec-88	YES	8010	EPA 8010	NO	ND(50)		
3 121 10	SOLID	02-Dec-88	YES	8010	EPA 8010	NO	ND(50)		

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	Methylene Chloride may be due to lab contamination.		
							RESULTS	ND- Not Detected	NA-Not Analyzed	
								(50)- Detection Limit		
								UG/KG	Surface samples designated as 00'.	
3-101-00'	SOLID	17-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY	2,100	LEAD	5,800
							ARSENIC	1,100	MERCURY	ND
							BARIUM	99,000	MOLYBDENUM	ND
							BERYLLIUM	ND	NICKEL	8,500
							CADMIUM	300	SELENIUM	ND
							CHROMIUM, TOTAL	18,000	SILVER	ND
							CHROMIUM, HEX	ND	THALLIUM	ND
							COBALT	5,500	VANADIUM	19,000
							COPPER	14,000	ZINC	30,000
3-101-10'	SOLID	17-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY	ND	LEAD	3,200
							ARSENIC	950	MERCURY	ND
							BARIUM	65,000	MOLYBDENUM	ND
							BERYLLIUM	ND	NICKEL	6,800
							CADMIUM	900	SELENIUM	ND
							CHROMIUM, TOTAL	10,000	SILVER	ND
							CHROMIUM, HEX	ND	THALLIUM	ND
							COBALT	4,100	VANADIUM	16,000
							COPPER	42,000	ZINC	20,000
3-101-15'	SOLID	17-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY	ND	LEAD	2,300
							ARSENIC	670	MERCURY	ND
							BARIUM	35,000	MOLYBDENUM	ND
							BERYLLIUM	ND	NICKEL	3,800
							CADMIUM	1,100	SELENIUM	ND
							CHROMIUM, TOTAL	7,600	SILVER	ND
							CHROMIUM, HEX	ND	THALLIUM	ND
							COBALT	2,800	VANADIUM	14,000
							COPPER	29,000	ZINC	20,000
3-101-20'	SOLID	17-Jan-89	Yes	CAM	CAM Metals	No	ANTIMONY	ND	LEAD	4,100

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	Methylene Chloride may be due to lab contamination.		
							RESULTS	ND- Not Detected	NA-Not Analyzed	
							UG/KG	(50)- Detection Limit		
								Surface samples designated as 00'.		
				8010			ARSENIC	670	MERCURY	ND
							BARIUM	67,000	MOLYBDENUM	ND
							BERYLLIUM	ND	NICKEL	65,000
							CADMIUM	300	SELENIUM	ND
							CHROMIUM, TOTAL	14,000	SILVER	ND
							CHROMIUM, HEX	ND	THALLIUM	ND
							COBALT	4,600	VANADIUM	20,000
							COPPER	14,000	ZINC	28,000
3-102-00'	SOLID	04-Jan-89	Yes	CAM	CAM Metals	No	ANTIMONY	ND	LEAD	2,600
							ARSENIC	470	MERCURY	30
							BARIUM	48,000	MOLYBDENUM	ND
							BERYLLIUM	ND	NICKEL	11,000
							CADMIUM	2,200	SELENIUM	ND
							CHROMIUM, TOTAL	8,200	SILVER	ND
							CHROMIUM, HEX	ND	THALLIUM	ND
							COBALT	7,900	VANADIUM	15,000
							COPPER	9,800	ZINC	23,000
3-102-10'	SOLID	04-Jan-89	Yes	CAM	CAM Metals	No	ANTIMONY	1,150	LEAD	2,930
							ARSENIC	540	MERCURY	230
							BARIUM	65,000	MOLYBDENUM	ND
							BERYLLIUM	ND	NICKEL	5,900
							CADMIUM	240	SELENIUM	ND
							CHROMIUM, TOTAL	9,040	SILVER	300
							CHROMIUM, HEX	ND	THALLIUM	ND
							COBALT	4,060	VANADIUM	16,000
							COPPER	8,870	ZINC	24,000
3-102-15'	SOLID	04-Jan-89	Yes	CAM	CAM Metals	No	ANTIMONY	ND	LEAD	2,800

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	
							RESULTS UG/KG	Methylene Chloride may be due to lab contamination. ND- Not Detected NA-Not Analyzed (50)- Detection Limit Surface samples designated as 00'.
							ARSENIC	830
							BARIUM	34,000
							BERYLLIUM	ND
							CADMIUM	1,400
							CHROMIUM, TOTAL	8,200
							CHROMIUM, HEX	ND
							COBALT	7,000
							COPPER	9,400
							MERCURY	30
							MOLYBDENUM	ND
							NICKEL	8,400
							SELENIUM	ND
							SILVER	ND
							THALLIUM	ND
							VANADIUM	12,000
							ZINC	33,000
3-102-05'	SOLID	04-Jan-89	Yes	8010	EPA 8010	No	VINYL CHLORIDE	450
							TETRACHLOROETHENE	400
							ND (50)	
3-102-10'	SOLID	04-Jan-89	Yes	8010	EPA 8010	No	1,1-DICHLOROETHENE	300
							TETRACHLOROETHENE	1,250
							1,2-DICHLOROETHANE	250
							1,1,1-TRICHLOROETHANE	400
							TRICHLOROETHENE	700
							ND (50)	
3-102-15'	SOLID	04-Jan-89	Yes	8010	EPA 8010	No	1,1-DICHLOROETHENE	180
							TETRACHLOROETHENE	400
							TOLUENE	120
							ND (50)	
3-104-00'	SOLID	17-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY	79,000
							ARSENIC	1,800
							LEAD	41,000
							MERCURY	72

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	Methylene Chloride may be due to lab contamination.		
							RESULTS UG/KG	ND- Not Detected	NA-Not Analyzed	
								(50)- Detection Limit		
Surface samples designated as 00'.										
							BARIUM	61,000	MOLYBDENUM	210
							BERYLLIUM	ND	NICKEL	8,500
							CADMIUM	400	SELENIUM	ND
							CHROMIUM, TOTAL	4,600,000	SILVER	ND
							CHROMIUM, HEX	2,000	THALLIUM	490
							COBALT	5,000	VANADIUM	ND
							COPPER	67,000	ZINC	34,000
3-104-05'	SOLID	17-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY	46,000	LEAD	3,500
							ARSENIC	880	MERCURY	23
							BARIUM	64,000	MOLYBDENUM	140
							BERYLLIUM	ND	NICKEL	6,600
							CADMIUM	ND	SELENIUM	ND
							CHROMIUM, TOTAL	3,200,000	SILVER	ND
							CHROMIUM, HEX	130,000	THALLIUM	2,200
							COBALT	4,000	VANADIUM	7,000
							COPPER	43,000	ZINC	28,000
3-104-10'	SOLID	17-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY	64,000	LEAD	4,400
							ARSENIC	1,200	MERCURY	ND
							BARIUM	75,000	MOLYBDENUM	90
							BERYLLIUM	ND	NICKEL	7,600
							CADMIUM	ND	SELENIUM	ND
							CHROMIUM, TOTAL	3,900,000	SILVER	70
							CHROMIUM, HEX	63,000	THALLIUM	ND
							COBALT	6,000	VANADIUM	9,300
							COPPER	47,000	ZINC	30,000

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	Methylene Chloride may be due to lab contamination.		
							RESULTS UG/KG	ND- Not Detected	NA-Not Analyzed	
								(50)- Detection Limit		
Surface samples designated as 00'.										
3-104-15'	SOLID	17-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY	21,000	LEAD	2,800
							ARSENIC	500	MERCURY	ND
							BARIUM	49,000	MOLYBDENUM	70
							BERYLLIUM	ND	NICKEL	8,200
							CADMIUM	80	SELENIUM	ND
							CHROMIUM, TOTAL	1,200,000	SILVER	ND
							CHROMIUM, HEX	875,000	THALLIUM	ND
							COBALT	4,000	VANADIUM	13,000
							COPPER	20,000	ZINC	18,000
3-104-20'	SOLID	17-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY	2,000	LEAD	3,700
							ARSENIC	690	MERCURY	ND
							BARIUM	74,000	MOLYBDENUM	ND
							BERYLLIUM	ND	NICKEL	7,100
							CADMIUM	400	SELENIUM	ND
							CHROMIUM, TOTAL	34,000	SILVER	ND
							CHROMIUM, HEX	17,000	THALLIUM	ND
							COBALT	4,800	VANADIUM	20,000
							COPPER	9,500	ZINC	28,000
3-104-20'	SOLID	04-Jan-89	Yes	CAM 8010	EPA '8010	No	TETRACHLOROETHENE ND (50)	100		
3-106-00'	SOLID	12-Jan-89	Yes	CAM	CAM Metals	No	ANTIMONY	2,000	LEAD	7,300
							ARSENIC	1,500	MERCURY	90
							BARIUM	91,000	MOLYBDENUM	150
							BERYLLIUM	ND	NICKEL	8,500
							CADMIUM	400	SELENIUM	ND

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:		Methylene Chloride may be due to lab contamination.	
							RESULTS	UG/KG	ND-- Not Detected	NA--Not Analyzed
									(50)-- Detection Limit	Surface samples designated as 00'.
							CHROMIUM, TOTAL	32,000	SILVER	80
							CHROMIUM, HEX	7,000	THALLIUM	ND
							COBALT	4,300	VANADIUM	15,000
							COPPER	77,000	ZINC	39,000
3-106-05'	SOLID	12-Jan-89	Yes	CAM	CAM Metals	No	ANTIMONY	1,000	LEAD	2,220
							ARSENIC	830	MERCURY	ND
							BARIUM	50,000	MOLYBDENUM	ND
							BERYLLIUM	ND	NICKEL	3,860
							CADMIUM	180	SELENIUM	ND
							CHROMIUM, TOTAL	15,000	SILVER	ND
							CHROMIUM, HEX	8,000	THALLIUM	ND
							COBALT	3,090	VANADIUM	14,000
							COPPER	7,150	ZINC	17,000
3-106-00'	SOLID	12-Jan-89	Yes	8010	EPA 8010	No	TETRACHLOROETHENE	150		
							ND (50)			
3-106-05'	SOLID	12-Jan-89	Yes	8010	EPA 8010	No	TETRACHLOROETHENE	150		
							ND (50)			
3-106-10'	SOLID	12-Jan-89	Yes	CAM 8010	EPA 8010	No	TETRACHLOROETHENE	1,300		
							1,1,1-TRICHLOROETHANE	500		
							TRICHLOROETHENE	500		
							ND (50)			
3-107-00'	SOLID	12-Nov-88	UNKNOWN	CAM	CAM Metals	No	CHROMIUM, HEX	155,000		

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	Methylene Chloride may be due to lab contamination.		
							RESULTS UG/KG	ND- Not Detected	NA-Not Analyzed	
								(50)- Detection Limit		
								Surface samples designated as 00'.		
		29-Dec-88 02-Dec-88								
3-107-00'	SOLID	12-Jan-89	Yes	8010	EPA 8010	No	TETRACHLOROETHENE 1,1,1-TRICHLOROETHANE ND (50)	2,000 800		
3-107-00'	SOLID	12-Jan-89	Yes	CAM	CAM Metals	No	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROMIUM, TOTAL CHROMIUM, HEX COBALT COPPER	9,010 380 71,000 ND 700 590,000 120,000 3,700 14,000	LEAD MERCURY MOLYBDENUM NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	4,410 ND 50 7,070 ND ND ND 11,000 29,000
3-107-05'	SOLID	12-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROMIUM, TOTAL CHROMIUM, HEX COBALT COPPER	ND 470 75,000 ND 900 21,000 3,000 5,490 29,000	LEAD MERCURY MOLYBDENUM NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	3,350 ND 100 9,040 ND ND ND 16,000 32,000
3-107-10'	SOLID	12-Jan-89	Yes	CAM	CAM Metals	No	ANTIMONY	9,700	LEAD	2,430

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	Methylene Chloride may be due to lab contamination.		
							RESULTS UG/KG	ND-- Not Detected	NA--Not Analyzed	
								(50)-- Detection Limit Surface samples designated as 00'.		
				8010			ARSENIC	ND	MERCURY	ND
							BARIUM	71,000	MOLYBDENUM	ND
							BERYLLIUM	ND	NICKEL	4,330
							CADMIUM	600	SELENIUM	ND
							CHROMIUM, TOTAL	730,000	SILVER	ND
							CHROMIUM, HEX	22,000	THALLIUM	ND
							COBALT	3,000	VANADIUM	12,000
							COPPER	22,000	ZINC	21,000
3-107-15'	SOLID	12-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY	ND	LEAD	1,700
							ARSENIC	ND	MERCURY	ND
							BARIUM	66,000	MOLYBDENUM	ND
							BERYLLIUM	ND	NICKEL	2,920
							CADMIUM	100	SELENIUM	ND
							CHROMIUM, TOTAL	17,000	SILVER	ND
							CHROMIUM, HEX	8,000	THALLIUM	ND
							COBALT	2,480	VANADIUM	9,140
							COPPER	6,060	ZINC	17,000
3-109-06'	SOLID	18-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY	1,200	LEAD	5,200
							ARSENIC	760	MERCURY	90
							BARIUM	60,000	MOLYBDENUM	ND
							BERYLLIUM	ND	NICKEL	8,100
							CADMIUM	400	SELENIUM	ND
							CHROMIUM, TOTAL	17,000	SILVER	ND
							CHROMIUM, HEX	ND	THALLIUM	ND
							COBALT	5,400	VANADIUM	18,000
							COPPER	14,000	ZINC	47,000

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE: RESULTS UG/KG	Methylene Chloride may be due to lab contamination. ND- Not Detected NA-Not Analyzed (50)- Detection Limit Surface samples designated as 00'.	
3-109-10'	SOLID	18-Jan-89	Yes	CAM	EPA 8010	No	TETRACHLOROETHENE ND (50)	2,500	
3-110-05'	SOLID	19-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROMIUM, TOTAL CHROMIUM, HEX COBALT COPPER	1,010 750 100,000 ND 200 11,000 ND 4,900 11,000	LEAD MERCURY MOLYBDENUM NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC 4,000 ND ND 6,800 ND ND 400 20,000 27,000
3-110-15'	SOLID	19-Jan-89	Yes	CAM	CAM Metals	No	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROMIUM, TOTAL CHROMIUM, HEX COBALT COPPER	1,700 770 110,000 ND 300 13,000 ND 4,800 15,000	LEAD MERCURY MOLYBDENUM NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC 3,800 ND ND 7,000 ND ND 600 19,000 29,000
3-110-15'	SOLID	19-Jan-89	Yes	8010	EPA 8010	No	TETRACHLOROETHENE 1,1,1-TRICHLOROETHANE ND (50)	10,000 2,000	

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	Methylene Chloride may be due to lab contamination.		
							RESULTS UG/KG	ND-- Not Detected	NA--Not Analyzed	
								(50)-- Detection Limit		
Surface samples designated as 00'.										
3-111-00'	SOLID	19-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY	1,850	LEAD	4,800
							ARSENIC	1,000	MERCURY	ND
							BARIUM	120,000	MOLYBDENUM	ND
							BERYLLIUM	ND	NICKEL	8,800
							CADMIUM	300	SELENIUM	ND
							CHROMIUM, TOTAL	17,000	SILVER	ND
							CHROMIUM, HEX	ND	THALLIUM	ND
							COBALT	6,000	VANADIUM	22,000
							COPPER	14,000	ZINC	30,000
							3-111-10'	SOLID	19-Jan-89	Yes
ARSENIC	1,100	MERCURY	ND							
BARIUM	130,000	MOLYBDENUM	ND							
BERYLLIUM	ND	NICKEL	8,000							
CADMIUM	200	SELENIUM	ND							
CHROMIUM, TOTAL	13,000	SILVER	ND							
CHROMIUM, HEX	ND	THALLIUM	ND							
COBALT	5,600	VANADIUM	23,000							
COPPER	13,000	ZINC	32,000							
3-111-20'	SOLID	19-Jan-89	Yes	8010	EPA 8010	No				
							1,1,1-TRICHLOROETHANE	1,000		
							ND (50)			
3-112-05'	SOLID	30-Dec-88	Yes	CAM 8010	CAM Metals	No	ANTIMONY	3,000	LEAD	280,000
							ARSENIC	1,100	MERCURY	80
							BARIUM	110,000	MOLYBDENUM	2,200

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	
							RESULTS UG/KG	Methylene Chloride may be due to lab contamination. ND-- Not Detected NA--Not Analyzed (50)-- Detection Limit Surface samples designated as 00'.
							BERYLLIUM	ND(50)
							CADMIUM	ND(50)
							CHROMIUM, TOTAL	150,000
							CHROMIUM, HEX	ND(1000)
							COBALT	900
							COPPER	13,000
							NICKEL	1,400
							SELENIUM	ND(100)
							SILVER	2,200
							THALLIUM	ND(300)
							VANADIUM	8,100
							ZINC	12,000
3-112-05'	SOLID	30-Dec-88	UNKNOWN	CAM	CAM Metals	No	LEAD	240,000
3-112-10'	SOLID	30-Dec-88	Yes	CAM	CAM Metals	No	ANTIMONY	8,000
							ARSENIC	1,200
							BARIUM	29,000
							BERYLLIUM	ND(50)
							CADMIUM	190
							CHROMIUM, TOTAL	300,000
							CHROMIUM, HEX	6,180
							COBALT	900
							COPPER	35,000
							LEAD	140,000
							MERCURY	50
							MOLYBDENUM	1,100
							NICKEL	3,200
							SELENIUM	ND(100)
							SILVER	420
							THALLIUM	ND(300)
							VANADIUM	19,000
							ZINC	8,300
3-112-10'	SOLID	30-Dec-88	UNKNOWN	CAM	CAM Metals	No	LEAD	64,000
3-112-10'	SOLID	30-Dec-88	Yes	8010	EPA 8010	No	TETRACHLOROETHENE	6,000
							CHLOROBENZENE	2,000
							ND (100)	

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	Methylene Chloride may be due to lab contamination.		
							RESULTS	ND- Not Detected	NA-Not Analyzed	
								(50)- Detection Limit		
								Surface samples designated as 00'.		
3-112-15'	SOLID	30-Dec-88	Yes	CAM 8010	CAM Metals	No	ANTIMONY	4,000	LEAD	110,000
							ARSENIC	690	MERCURY	230
							BARIUM	19,000	MOLYBDENUM	900
							BERYLLIUM	ND(50)	NICKEL	7,700
							CADMIUM	150	SELENIUM	ND(100)
							CHROMIUM, TOTAL	180,000	SILVER	2,100
							CHROMIUM, HEX	18,800	THALLIUM	ND(300)
							COBALT	1,100	VANADIUM	13,000
							COPPER	90,000	ZINC	19,000
3-112-15'	SOLID	30-Dec-88	UNKNOWN	CAM 8010	CAM Metals	No	LEAD	120,000		
3-112-15'	SOLID	30-Dec-88	Yes	8010	EPA 8010	No	TETRACHLOROETHENE	30,000		
							CHLOROBENZENE	10,000		
							ND (50)			
3-112-15'	SOLID	30-Dec-88	Yes	9010 pH	EPA 9012 EPA 9040	No	CYANIDE	ND (50)		
							PH	4.10 UNITS		
3-113-17'	SOLID	18-Jan-89	Yes	8010	EPA 8010	No	TETRACHLOROETHENE	150		
							ND (50)			
3-114-05'	SOLID	30-Dec-88	Yes	CAM 8010	CAM Metals	No	ANTIMONY	2,000	LEAD	5,400
							ARSENIC	1,200	MERCURY	ND(20)
							BARIUM	120,000	MOLYBDENUM	ND(50)

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	
							RESULTS UG/KG	Methylene Chloride may be due to lab contamination. ND- Not Detected NA-Not Analyzed (50)- Detection Limit Surface samples designated as 00'.
							BERYLLIUM	ND(50)
							CADMIUM	300
							CHROMIUM, TOTAL	15,000
							CHROMIUM, HEX	ND(1000)
							COBALT	5,800
							COPPER	22,000
							NICKEL	9,400
							SELENIUM	ND(100)
							SILVER	ND(50)
							THALLIUM	ND(300)
							VANADIUM	22,000
							ZINC	35,000
3-115-00'	SOLID	27-Dec-88	Yes	CAM	CAM Metals	No	ANTIMONY	2,000
							ARSENIC	740
							BARIUM	41,000
							BERYLLIUM	ND
							CADMIUM	3,000
							CHROMIUM	93,000
							CHROMIUM, HEX	ND
							COBALT	3,300
							COPPER	990,000
							LEAD	78,000
							MERCURY	620
							MOLYBDENUM	1,600
							NICKEL	440,000
							SELENIUM	ND
							SILVER	3,000
							THALLIUM	ND
							VANADIUM	9,100
							ZINC	760,000
3-115-00'	SOLID	27-Dec-88	UNKNOWN	CAM	CAM Metals	No	COPPER	770,000
							NICKEL	440,000
							LEAD	47,000
3-115-00'	SOLID	27-Dec-88	Yes	8010	EPA 8240	No	TRICHLOROETHENE	1,900
							TETRACHLOROETHENE	42
							ND (50)	
3-115-05'	SOLID	30-Dec-88	Yes	8010	EPA 8010	No	TETRACHLOROETHENE	300
							CHLOROBENZENE	5,000

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	
							RESULTS UG/KG	Methylene Chloride may be due to lab contamination. ND-- Not Detected NA--Not Analyzed (50)-- Detection Limit Surface samples designated as 00'.
							ND (100)	
3-116-02'	SOLID	28-Dec-88	Yes	CAM 8010	EPA 8240	No	TRICHLOROETHENE TOLUENE ND (50)	150 29
3-117-01'	SOLID	28-Dec-88	Yes	CAM	CAM Metals	No	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROMIUM CHROMIUM, HEX COBALT COPPER	5,000 2,200 9,000 ND 530 220,000 ND 1,700 69,000
							LEAD	180,000 140 4,600 4,900 ND 160 ND 14,000 31,000
3-117-01'	SOLID	28-Dec-88	UNKNOWN	CAM	CAM Metals	No	LEAD	57,000
3-117-05'	SOLID	28-Dec-88	Yes	CAM	CAM Metals	No	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROMIUM CHROMIUM, HEX COBALT COPPER	1,000 680 110,000 ND ND 42,000 ND 600 11,000
							LEAD MERCURY MOLYBDENUM NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	27,000 1,500 1,300 1,600 ND 450 ND 5,600 7,900

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	
							RESULTS UG/KG	Methylene Chloride may be due to lab contamination. ND- Not Detected NA-Not Analyzed (50)- Detection Limit Surface samples designated as 00'.
3-117-10'	SOLID	28-Dec-88	Yes	CAM	CAM Metals	No	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROMIUM CHROMIUM, HEX COBALT COPPER	3,000 1,200 41,000 ND 90 120,000 4,000 400 29,000 LEAD MERCURY MOLYBDENUM NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC 170,000 1,400 2,000 2,100 ND 440 ND 8,200 14,000
3-117-10'	SOLID	28-Dec-88	UNKNOWN	CAM	CAM Metals	No	LEAD	190,000
3-117-15'	SOLID	28-Dec-88	Yes	CAM	CAM Metals	No	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROMIUM CHROMIUM, HEX COBALT COPPER	2,000 ND 54,000 ND 200 88,000 ND 1,400 92,000 LEAD MERCURY MOLYBDENUM NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC 78,000 1,000 1,800 3,200 ND 560 ND 13,000 24,000
3-117-15'	SOLID	28-Dec-88	UNKNOWN	CAM	CAM Metals	No	LEAD	59,000

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	Methylene Chloride may be due to lab contamination.		
							RESULTS	ND- Not Detected	NA-Not Analyzed	
								(50)- Detection Limit		
							UG/KG	Surface samples designated as 00'.		
3-117-01'	SOLID	28-Dec-88	Yes	8010	EPA 8240	No	TETRACHLOROETHENE	3,600		
							BROMOMETHANE	340		
							TOLUENE	120		
							1,1-DICHLOROETHENE	180		
							ND (50)			
3-117-05'	SOLID	28-Dec-88	Yes	8010	EPA 8240	No	1,1,1 TRICHLOROETHANE	300		
							TRICHLORONETHENE	330		
							TETRACHLOROETHENE	210		
							TOLUENE	110		
							1,1-DICHLOROETHENE	330		
ND (50)										
3-117-10'	SOLID	28-Dec-88	Yes	8010	EPA 8240	No	TETRACHLOROETHENE	210		
							ACETONE	80		
							1,1,1 TRICHLOROETHANE	74		
							2-BUTANONE	86		
							ND (50)			
3-117-15'	SOLID	28-Dec-88	Yes	8010	EPA 8240	No	TETRACHLOROETHENE	1,300		
							1,1,1 TRICHLOROETHANE	130		
							TRICHLOROENTHENE	50		
							ND (50)			
3-118-01'	SOLID	29-Dec-88	Yes	CAM	CAM Metals	No	ANTIMONY	1,000	LEAD	35,000
							ARSENIC	ND	MERCURY	20
							BARIUM	95,000	MOLYBDENUM	370

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	Methylene Chloride may be due to lab contamination.									
							RESULTS	ND-- Not Detected	NA--Not Analyzed								
								(50)-- Detection Limit									
							UG/KG	Surface samples designated as 00'.									
							BERYLLIUM	ND	NICKEL	700							
							CADMIUM	ND	SELENIUM	ND							
							CHROMIUM	73,000	SILVER	350							
							CHROMIUM, HEX	ND	THALLIUM	ND							
							COBALT	100	VANADIUM	700							
							COPPER	17,000	ZINC	3,300							
							3-118-05'	SOLID	29-Dec-88	Yes	CAM	CAM Metals	No	ANTIMONY	ND	LEAD	28,000
														ARSENIC	ND	MERCURY	30
														BARIUM	39,000	MOLYBDENUM	620
														BERYLLIUM	ND	NICKEL	890
CADMIUM	ND	SELENIUM	ND														
CHROMIUM	41,000	SILVER	100														
CHROMIUM, HEX	ND	THALLIUM	ND														
COBALT	340	VANADIUM	3,100														
COPPER	11,000	ZINC	1,900														
3-118-10'	SOLID	29-Dec-88	Yes	CAM	CAM Metals	No	ANTIMONY	2,500	LEAD	82,000							
							ARSENIC	650	MERCURY	80							
							BARIUM	60,000	MOLYBDENUM	1,600							
							BERYLLIUM	ND	NICKEL	1,800							
							CADMIUM	100	SELENIUM	ND							
							CHROMIUM	130,000	SILVER	300							
							CHROMIUM, HEX	ND	THALLIUM	ND							
							COBALT	800	VANADIUM	17,000							
							COPPER	9,500	ZINC	3,200							
							3-118-10'	SOLID	28-Dec-88	UNKNOWN	CAM	CAM Metals	No	LEAD	92,000		

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	
							RESULTS UG/KG	Methylene Chloride may be due to lab contamination. ND- Not Detected NA-Not Analyzed (50)- Detection Limit Surface samples designated as 00'.
3-118-20'	SOLID	29-Dec-88	Yes	CAM	CAM Metals	No	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROMIUM CHROMIUM, HEX COBALT COPPER	ND 1,200 79,000 ND 5,700 10,000 ND 3,300 18,000 LEAD MERCURY MOLYBDENUM NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC 5,500 130 170 5,800 ND ND ND 16,000 37,000
3-118-01'	SOLID	29-Dec-88	Yes	8010	EPA 8240	No	TETRACHLOROETHENE ND (50)	720
3-118-05'	SOLID	29-Dec-88	No	8010	EPA 8240	No	TOLUENE ND (50)	250
3-118-10'	SOLID	29-Dec-88	No	8010	EPA 8240	No	1,1,2,2-TETRACHLOROETHANE ND (50)	7,000
3-118-20'	SOLID	29-Dec-88	No	8010	EPA 8240	No	1,1,1-TRICHLOROETHANE TRICHLOROETHENE TETRACHLOROETHENE ND (50)	32,000 4,500 120,000
3-119-01	SOLID	12-Nov-88	UNKNOWN	CAM	CAM Metals	No	CHROMIUM, HEX ND(5000)	

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	
							RESULTS UG/KG	Methylene Chloride may be due to lab contamination. ND- Not Detected NA-Not Analyzed (50)- Detection Limit Surface samples designated as 00'.
		02-Dec-88		8010				
3-119-01'	SOLID	29-Dec-88	Yes	CAM 8010	CAM Metals	No	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROMIUM CHROMIUM, HEX COBALT COPPER	ND 650 69,000 ND 900 1,400,000 145,000 6,000 51,000
							LEAD MERCURY MOLYBDENUM NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	4,400 70 ND 13,000 ND ND ND 8,800 50,000
3-119-05'	SOLID	12-Nov-88 02-Dec-88	UNKNOWN	CAM 8010	CAM Metals	No	CHROMIUM, HEX	ND(1000)
3-119-05'	SOLID	29-Dec-88	Yes	CAM 8010	CAM Metals	No	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROMIUM CHROMIUM, HEX COBALT COPPER	12,000 570 61,000 ND 400 610,000 79,000 5,000 21,000
							LEAD MERCURY MOLYBDENUM NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	4,200 40 ND 10,000 ND ND ND 14,000 45,000
3-119-10'	SOLID	29-Dec-88	Yes	CAM 8010	CAM Metals	No	ANTIMONY ARSENIC BARIUM	5,000 520 87,000
							LEAD MERCURY MOLYBDENUM	7,200 40 610

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	Methylene Chloride may be due to lab contamination.		
							RESULTS	ND- Not Detected	NA-Not Analyzed	
								(50)- Detection Limit		
							UG/KG	Surface samples designated as 00'.		
							BERYLLIUM	ND	NICKEL	5,600
							CADMIUM	200	SELENIUM	ND
							CHROMIUM	170,000	SILVER	300
							CHROMIUM, HEX	2,000	THALLIUM	ND
							COBALT	2,800	VANADIUM	17,000
							COPPER	21,000	ZINC	19,000
3-119-15'	SOLID	12-Nov-88 02-Dec-88	UNKNOWN	CAM 8010	CAM Metals	No	CHROMIUM, HEX	19,000		
3-119-15'	SOLID	29-Dec-88	Yes	CAM 8010	CAM Metals	No	ANTIMONY	5,000	LEAD	2,900
							ARSENIC	560	MERCURY	80
							BARIUM	39,000	MOLYBDENUM	260
							BERYLLIUM	ND	NICKEL	3,400
							CADMIUM	110	SELENIUM	ND
							CHROMIUM	170,000	SILVER	150
							CHROMIUM, HEX	53,000	THALLIUM	ND
							COBALT	1,800	VANADIUM	13,000
							COPPER	12,000	ZINC	20,000
3-119-20'	SOLID	29-Dec-88	Yes	CAM 8010	CAM Metals	No	ANTIMONY	3,000	LEAD	15,000
							ARSENIC	ND	MERCURY	30
							BARIUM	87,000	MOLYBDENUM	400
							BERYLLIUM	ND	NICKEL	2,600
							CADMIUM	100	SELENIUM	ND
							CHROMIUM	110,000	SILVER	800
							CHROMIUM, HEX	2,000	THALLIUM	ND
							COBALT	1,400	VANADIUM	9,600
							COPPER	9,800	ZINC	6,200

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	
							RESULTS UG/KG	Methylene Chloride may be due to lab contamination. ND- Not Detected NA-Not Analyzed (50)- Detection Limit Surface samples designated as 00'.
3-118-20'	SOLID	28-Dec-88	Yes	8010	EPA 8240	NO	TETRACHLOROETHENE ACETONE TOLUENE ETHYLBENZENE TOTAL XYLENES 1,1,1-TRICHLOROETHANE ND (50)	320 50 100 32 65 44
3-120-01'	SOLID	02-Dec-88	Yes	CAM 8010	CAM Metals	NO	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROMIUM, TRI CHROMIUM, HEX COBALT COPPER	ND(1000) 1,300 98,000 ND(50) 1,600 31,000 ND(1000) 6,200 86,000
							LEAD MERCURY MOLYBDENUM NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	6,400 ND(20) 110 14,000 ND(100) ND(50) ND(300) 24,000 68,000
3-120-20'	SOLID	02-Dec-88	Yes	CAM 8010	CAM Metals	No	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROMIUM, TRI CHROMIUM, HEX COBALT COPPER	ND(1000) 1,100 75,000 ND(50) 3,400 11,000 ND(1000) 5,800 14,000
							LEAD MERCURY MOLYBDENUM NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	3,500 ND(200) ND(50) 7,300 ND(100) ND(100) ND(300) 23,000 48,000

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE: RESULTS UG/KG	Methylene Chloride may be due to lab contamination. ND- Not Detected NA-Not Analyzed (50)- Detection Limit Surface samples designated as 00'.		
3-120-25'	SOLID	12-Nov-88 29-Dec-88	UNKNOWN	CAM 8010	CAM Metals	No	CADMIUM	6,890		
3-120-25'	SOLID	02-Dec-88	Yes	CAM 8010	CAM Metals	No	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROMIUM, TRI CHROMIUM, HEX COBALT COPPER	ND(1000) 1,300 89,000 ND(50) 12,000 13,000 ND(1000) 6,300 9,100	LEAD MERCURY MOLYBDENUM NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	4,000 ND(20) 50 9,600 ND(100) ND(50) ND(300) 24,000 92,000
3-121-00'	SOLID	02-Dec-88	Yes	CAM	CAM Metals	No	ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHROMIUM, TRI CHROMIUM, HEX COBALT COPPER	1,000 1,500 140,000 ND(50) 500 17,000 ND(1000) 7,000 16,000	LEAD MERCURY MOLYBDENUM NICKEL SELENIUM SILVER THALLIUM VANADIUM ZINC	5,000 ND(20) ND(50) 10,000 ND(100) ND(50) ND(300) 28,000 37,000
3-144-00'	SOLID	19-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY ARSENIC BARIUM BERYLLIUM	1,000 740 110,000 ND	LEAD MERCURY MOLYBDENUM NICKEL	5,500 ND ND 7,800

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	Methylene Chloride may be due to lab contamination.		
							RESULTS UG/KG	ND- Not Detected (50)- Detection Limit	NA-Not Analyzed	
							CADMIUM	300	SELENIUM	ND
							CHROMIUM, TRI	13,000	SILVER	ND
							CHROMIUM, HEX	ND	THALLIUM	ND
							COBALT	4,900	VANADIUM	18,000
							COPPER	17,000	ZINC	37,000
3-144-10'	SOLID	19-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY	1,700	LEAD	4,700
							ARSENIC	1,100	MERCURY	ND
							BARIUM	120,000	MOLYBDENUM	ND
							BERYLLIUM	ND	NICKEL	7,900
							CADMIUM	300	SELENIUM	ND
							CHROMIUM, TRI	13,000	SILVER	ND
							CHROMIUM, HEX	ND	THALLIUM	ND
							COBALT	5,900	VANADIUM	23,000
							COPPER	13,000	ZINC	31,000
3-144-20'	SOLID	19-Jan-89	Yes	CAM 8010	CAM Metals	No	ANTIMONY	1,300	LEAD	4,800
							ARSENIC	750	MERCURY	ND
							BARIUM	100,000	MOLYBDENUM	ND
							BERYLLIUM	ND	NICKEL	7,000
							CADMIUM	200	SELENIUM	ND
							CHROMIUM, TRI	11,000	SILVER	ND
							CHROMIUM, HEX	ND	THALLIUM	ND
							COBALT	5,000	VANADIUM	22,000
							COPPER	12,000	ZINC	30,000
3-122	BULK	02-Dec-88	Yes	CAM	CAM Metals	No	ANTIMONY	11,000	LEAD	180,000
							ARSENIC	710	MERCURY	1,700

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE: RESULTS UG/KG	Methylene Chloride may be due to lab contamination. ND-- Not Detected NA--Not Analyzed (50)-- Detection Limit Surface samples designated as 00'	
								BARIUM	14,000
								BERYLLIUM	ND(500)
								CADMIUM	44,000
								CHROMIUM, TRI	30,000,000
								CHROMIUM, HEX	ND(1000)
								COBALT	20,000
								COPPER	410,000
								MOLYBDENUM	1,700
								NICKEL	9,400
								SELENIUM	100
								SILVER	3,600
								THALLIUM	ND(300)
								VANADIUM	ND(500)
								ZINC	410,000
3-122	BULK	02-Dec-88	Yes	8010	EPA 8010	No	METHYLENE CHLORIDE ND(1000)	17,000	
3-123	BULK	02-Dec-88	Yes	CAM	CAM Metals	No	ANTIMONY	8,700	LEAD 280,000
							ARSENIC	670	MERCURY NA
							BARIUM	10,000	MOLYBDENUM 900
							BERYLLIUM	ND(50)	NICKEL 3,800
							CADMIUM	10,000	SELENIUM ND(100)
							CHROMIUM, TRI	5,500,000	SILVER 1,900
							CHROMIUM, HEX	ND(1000)	THALLIUM ND(300)
							COBALT	6,000	VANADIUM ND(500)
							COPPER	80,000	ZINC 170,000
3-123	BULK	02-Dec-88	Yes	8010	EPA 8010	No	METHYLENE CHLORIDE ND(1000)	300	
3-124	BULK	02-Dec-88	Yes	CAM 8010	CAM Metals	No	ANTIMONY	ND(20000)	LEAD 27,000
							ARSENIC	1,200	MERCURY NA
							BARIUM	14,000	MOLYBDENUM ND(1000)

A. L. BURKE--MARCH 1989--ANALYTICAL RESULTS

SAMPLE I.D.	TYPE	COLLECTION DATE	HOLDING TIMES MET	ANALYTICAL METHOD REQUESTED	ANALYTICAL METHOD PERFORMED	WET PERFORMED	NOTE:	Methylene Chloride may be due to lab contamination.		
							RESULTS	ND- Not Detected (50)- Detection Limit	NA-Not Analyzed	
							UG/KG	Surface samples designated as 00'.		
							BERYLLIUM	ND(1000)	NICKEL	10,000
							CADMIUM	4,600	SELENIUM	800
							CHROMIUM, TRI	140,000	SILVER	ND(1000)
							CHROMIUM, HEX	(NOT ANALYZED)	THALLIUM	ND(1000)
							COBALT	1,900	VANADIUM	ND(1000)
							COPPER	160,000	ZINC	35,000,00
							ANTIMONY	ND(5000)	LEAD	4,900
							ARSENIC	130	MERCURY	30
							BARIUM	1,000	MOLYBDENUM	ND(300)
							BERYLLIUM	ND(300)	NICKEL	21,000
							CADMIUM	ND(300)	SELENIUM	ND(100)
							CADMIUM	ND(50)		
							CHROMIUM, HEX	ND(1000)		
3-BLANK	SOLID	12-Nov-88	Yes	CAM	CAM Metals	No	CADMIUM	ND(50)		
		29-Dec-88					CHROMIUM, HEX	ND(1000)		
		02-Dec-88								

Appendix C

APPENDIX C

QUALITY ASSURANCE/QUALITY CONTROL PLAN



**QUALITY ASSURANCE/QUALITY CONTROL PLAN
FOR
ITT FACILITY
BURBANK, CALIFORNIA**

2 November 1989

W.O. No. 2588-08-01

Prepared by:

Roy F. Weston, Inc.
1350 Treat Blvd., Suite 200
Walnut Creek, California 94596

TABLE OF CONTENTS

<u>Section</u>	<u>Description</u>	<u>Page</u>
1.0	INTRODUCTION	1
2.0	PROJECT ORGANIZATION AND RESPONSIBILITY	1
	2.1 Operational Responsibilities	3
	2.2 Laboratory Responsibilities	3
	2.3 Quality Assurance Responsibilities	3
3.0	QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA	4
	3.1 Level of Quality Control Effort	4
	3.2 Quality Assurance Objectives for Accuracy	5
	3.2.1 Inorganic Analysis	6
	3.2.2 Organic Analysis	6
	3.3 Quality Assurance Objectives for Precision	6
	3.3.1 Metals Analyses (Inorganics)	7
	3.3.2 Organics Analyses	7
	3.4 Quality Assurance Objectives for Data Completeness	7
	3.5 Field Measurements	8
	3.6 Field Records	8
4.0	CALIBRATION PROCEDURES AND FREQUENCY	9
	4.1 Field Equipment	9
	4.3 Laboratory Equipment	9
5.0	FIELD EQUIPMENT	9
	5.1 Preventive Maintenance	9
	5.2 Decontamination	9
6.0	SAMPLING PROCEDURES	9
	6.1 Soil Boring Procedures	10
7.0	SAMPLE QUALITY CONTROL PROCEDURES	10
	7.1 Field Quality Control	10
	7.2 Laboratory Quality Control	11
	7.3 Soil-Gas Quality Control	11

8.0	SAMPLE CUSTODY	11
8.1	Laboratory Custody Procedures	11
8.1.1	Sample Receipt	11
8.1.2	Sample Storage	12
9.0	ANALYTICAL PROCEDURES	12
10.0	LABORATORY DATA ASSESSMENT PROCEDURES	12
11.0	DATA REDUCTION, VALIDATION AND REPORTING	16
12.0	AUDITS	17
13.0	CORRECTIVE ACTION PROCEDURES	17
14.0	QUALITY ASSURANCE REPORTS	18
ATTACHMENT A - QUALITY ASSURANCE/QUALITY CONTROL DATA ACCEPTANCE		
ATTACHMENT B - QUALITY ASSURANCE/QUALITY CONTROL CONTROL DEFINITIONS		

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
2-1	Project Organization	2

1.0 INTRODUCTION

The process of measurement, estimation, or prediction of current and future environmental contamination generally involves the use of data retrieved from existing sources and/or collected by field sampling and analysis. The accuracy and utility of these data are dictated by the quality control and quality assurance procedures that have gone into their generation. Before any data or information are used to draw conclusions about environmental contamination, or lack thereof, it is extremely important to quantify the uncertainties in the methods used to produce the data or information. This is especially critical in a remedial investigation/feasibility study process, in which data errors can be propagated and magnified at each step in the decision chain.

This plan presents the policies, data quality objectives, specific quality assurance and quality control requirements, procedures, responsibilities, custody, laboratory analyses, and documentation that will be employed during the investigations to ensure the defensibility of the collected data. It will serve as the quality assurance/quality control plan (QA/QC Plan) for the investigation at the ITT site in Glendale/Burbank. The Sampling and Analysis Plan will provide more detailed information on site-specific activities.

Subcontractors generating data for the investigation/characterization are responsible for ensuring that the precision, accuracy, completeness, and representativeness of their data are known and documented. To ensure that responsibilities are uniformly met, each subcontractor will review and adhere to this QA/QC Plan and Roy F. Weston (WESTON) Standard Operating Procedures.

A kickoff quality assurance/quality control meeting will be held before field work begins to review the project work and quality assurance/quality control plans and procedures. Attendance at this meeting will be documented to provide evidence of quality assurance training.

A significant amount of environmental data has already been collected at this site. Existing data or information being considered for use in this project will be evaluated to ascertain if it meets the quality assurance criteria. The data acceptance criteria used to evaluate these data and the definitions used in this plan are attached to this document.

2.0 PROJECT ORGANIZATION AND RESPONSIBILITY

WESTON's organizational chart for this project is shown in Figure 2.1. Any changes to the proposed project staffing will be submitted as an addendum to this QA/QC Plan. Project personnel are

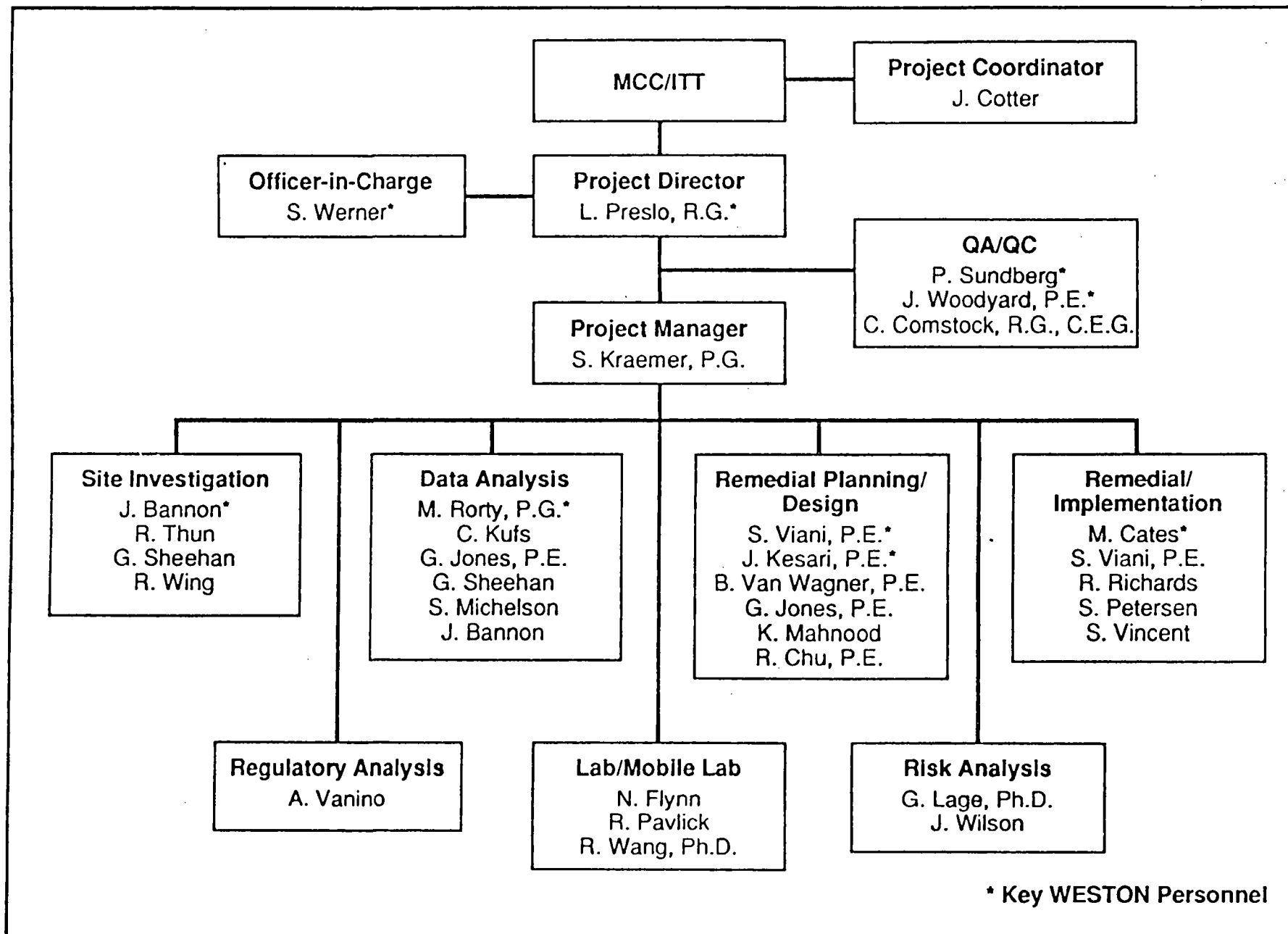


FIGURE 2-1 PROJECT ORGANIZATION

assigned responsibilities in the areas of operations, laboratory analysis, and quality assurance.

2.1 Operational Responsibilities

- The project director is responsible for overall management of the project. Her primary responsibilities are to provide full access to the resources of the WESTON organization and to ensure the project quality, timeliness, and cost-effectiveness. The project director is responsible for the final document review of all reports, plans, and project documents.
- The project manager is responsible for the daily management of the project and support staff. The project manager develops schedules, coordinates the work, and serves as client liaison. Based upon reports from the quality assurance manager, the project manager will verify that the sampling and analyses are conducted in full compliance with the QA/QC Plan and initiate corrective actions suggested by the QA/QC manager. The project manager is also responsible for the final document review of all reports, plans, and project documents.
- The technical review team is responsible for the technical quality of all reports and plans. The review team will review, comment, and approve all project reports and plans from a technical viewpoint.

2.2 Laboratory Responsibilities

Laboratory responsibilities for this investigation will consist of performing analytical services and producing data packages. The currently designated project laboratory is the WESTON Analytical Laboratory in Stockton, California. This laboratory is both a California Department of Health Services accredited laboratory and an EPA Contract Laboratory Program (CLP) facility.

2.3. Quality Assurance Responsibilities

Quality assurance responsibilities include monitoring and reviewing the procedures used to perform all aspects of the investigations (for example, data collection, analytical services, and report preparation). Primary responsibility for project quality rests with the project manager.

The project manager's responsibilities include the following:

- On-going review of individual quality assurance procedures.

- Overall quality assurance for project activities.
- Overall quality assurance for laboratory activities.
- Coordination of internal and external quality assurance audits.
- Quality assurance for field activities.
- Overall coordination of the quality assurance/quality control plan.
- Periodic reports to management, including suggestions for performing and verifying corrective actions.

The project director retains the ultimate authority for maintenance of corporate QA/QC standards and operating procedures.

3.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA

The overall quality assurance objective is to implement the current WESTON procedures for field sampling, field testing, chain-of-custody, laboratory analysis, data analyses, and reporting. Specific procedures to be used for sampling, chain-of-custody, audits, preventive maintenance, and corrective actions are described in subsequent sections of this plan. The purpose of this section is to define the data quality objectives for this project, which are the goals for the accuracy, precision, completeness, representativeness, and comparability of measurement data from both field and laboratory measurements.

Most data derived in this project will be developed in the analytical laboratory from samples collected in the field. However, for some field activities, samples may not be collected, but such measurements as pH and temperature will be taken. The primary objectives of activities where field measurements will be taken are to verify that quality control checks are made and measured to the degree of accuracy consistent with their intended use and to ensure that the measurement procedures are documented.

3.1 Level of Quality Control Effort

Quality control is assured by introducing into the sample stream a number of additional samples with known composition or predictable relation to the unknown samples being analyzed. These introduced samples are called field duplicates, field blanks, and trip blanks. These will be submitted to the analytical laboratory so that the reliability of the laboratory's data can be assessed. Duplicate samples are collected and analyzed to assess laboratory precision. For heterogeneous matrices, soil matrix spikes and matrix spike duplicates are analyzed to check on laboratory

precision. Field blank samples are analyzed to check for procedural contamination or ambient site conditions that may cause sample contamination. Trip blanks may be used to assess whether cross-contamination from packaging and shipment occurred. The frequency of collection and analysis of blank and spiked samples is discussed in Section 7.

3.2 Quality Assurance Objectives for Accuracy

The accuracy, precision, and sensitivity of laboratory analytical data must satisfy the quality control acceptance criteria of the analytical protocols. Sensitivities required for analyses of organics, metals, and other inorganic compounds (in aqueous and solid matrices) will be the detection limits included in Section 9.

Analytical accuracy is often expressed as the percent recovery of an analyte that has been added to the sample (spiked) at a known concentration before analysis and is expressed by the following formula:

$$\text{Accuracy} = \% \text{ recovery} = \frac{\text{AT} - \text{AO}}{\text{AF}} \times 100\%,$$

where

AT = total amount found in spiked sample
AO = amount found in unspiked sample
AF = amount added to sample.

The spiked concentration will be specified by laboratory quality control requirements or may be determined relative to the background concentrations observed in the unspiked sample. In the latter case, the spiked concentration should be significantly different (2 to 5 times higher) from the background concentration to permit a reliable recovery calculation.

The quality assurance objectives for organic and inorganic analyses are different and are discussed separately in the following paragraphs.

3.2.1 Inorganic Analysis

For metals, analytical accuracy is measured from analysis of a laboratory control standard and a sample spiked with the element of interest. The quality assurance objectives for accuracy in metals analysis for these quality control samples are summarized below:

<u>Sample</u>	<u>Recovery (%)</u>
Laboratory control standard	80-120
Spiked sample	75-125

Recovery values outside the quality control limits for an laboratory controls standard will trigger corrective action (Section 13). Recovery values for spiked field samples are advisory only. For other inorganic parameters, laboratory control charts have been established and will be used to define quality assurance objectives.

3.2.2 Organic Analyses

For organic analyses (gas chromatography [GC] and GC/Mass Spectrometry [MS]), analytical accuracy is obtained from the analysis of samples or blanks that have been spiked with a select number of target analytes.

The quality assurance objectives for recovery from spiked samples are given in below. The recovery values for target analytes in field sample analyses are advisory only for routine laboratory analysis. Only recovery values for standard matrix samples (e.g., blanks) are used for triggering corrective action.

<u>Sample</u>	<u>Analytical Method</u>	<u>Recovery (%)</u>
Volatile Organics: Soil	8240	60-140
Purgeable Halocarbons: Water	601	70-110
Purgeable Aromatics: Water	602	40-110

3.3 Quality Assurance Objectives for Precision

Analytical precision is calculated by expressing as a percentage the difference between results of analysis of duplicate samples

relative to the average of those results for a given analyte. Precision can be expressed by the formula:

$$RPD = \frac{C1 - C2}{(C1 + C2)/2} \times 100\%$$

where

RPD = relative percent difference
C1 = concentration of analyte in sample
C2 = concentration of analyte in duplicate

The quality assurance objectives for metals (and other inorganic parameters) analysis are different from those for organic analyses. These quality assurance objectives are discussed separately in the sections below.

3.3.1 Metals Analyses (Inorganics)

For metals and other inorganics analyses, the quality assurance objective for precision between replicate analyses is 35% (RPD) or less for soil analyses.

3.3.2 Organics Analyses

For organics analyses (GC and GC/MS), precision is measured by comparing the recovery of a select number of target analytes in duplicate samples or blanks (e.g., matrix spike/matrix spike duplicate). The quality assurance objectives (expressed by the RPD for analysis of matrix spike and matrix spike duplicate samples) are 20% or less for soil analyses. These RPD limits are advisory only for field samples. Only evaluation of precision for standard matrices will trigger corrective action.

3.4 Quality Assurance Objectives for Data Completeness

Completeness is the ratio of the number of valid analytical data points that meet all the acceptance criteria to the total number of data points expected to be obtained under normal conditions.

The project quality objective for completeness on this project is 85%. The ability to meet or exceed this completeness objective depends on the nature of samples submitted for analysis. For example, the analytical methods proposed for use (particularly for organics analyses) are intended for analysis of environmental samples (low and medium hazard), and the applicability of these methods to nonroutine matrices, such as wipes and air samples, may result in a poor method performance and, therefore, adversely impact achievement of the data completeness goal.

The field data will be considered accurate and complete if the

quality criteria with respect to equipment, solutions, and calculations are met and adherence to appropriate standard procedures can be documented during an audit.

3.5 Field Measurements

Measurement data will be generated in many field activities, possibly including the following:

- Conducting geophysical surveys;
- Documenting measurement times and weather conditions;
- Locating and determining elevation of sampling stations;
- Using a photoionization detector or an organic vapor analyzer to make qualitative organic vapor screening measurements from solid samples;
- Measuring water levels in a borehole; and
- Testing for standard penetration.

These measurement data will provide reproducible and comparable measurements to a degree of accuracy consistent with the intended use of the data through the documented use of standard procedures.

Surveying will provide a common frame of reference for remedial investigation sampling points. All surveyed points will be reported in state plane coordinates, third order accuracy in conformance with the national mapping accuracy standards. Surveying will be performed by a California licensed surveyor.

3.6 Field Records

Field observations and other information pertaining to sample collection will be recorded in bound field notebooks using ink. These field notebooks will be used by the sampling team for recording information such as the site location, date/time, sampling locations, sample type, sampling equipment, sampling procedure, name(s) of sampler(s), and analyses to be performed. Any additional or unusual information will also be recorded, as appropriate. Such information may include the Unified Soil Classification System (USCS) designation for a soil sample and color or odor of sample.

4.0 CALIBRATION PROCEDURES AND FREQUENCY

All calibrations will be documented in bound logbooks or on project field forms indicating date, time, results, and person(s) who performed the calibration or operational check.

4.1 Field Equipment

Soil gas calibration protocols consist of initial multiple-point calibrations and the use of daily standards at the beginning of each shift. The calibration and frequency requirements for field test measurements are given in the Sampling and Analysis Plan.

Photoionization detectors and organic vapor analyzers will be tested and calibrated on a daily basis, in accordance with the manufacturers' instructions.

An operational check will be performed, not an actual calibration, for surface geophysics instrumentation. This check will indicate whether calibration by the manufacture is required.

4.2. Laboratory Equipment

Guidelines for analytical instrumental calibrations are defined in the Analytical Laboratory Quality Assurance Plan for the WESTON laboratory. Analytical instrumentation calibrations are an integral part of the laboratory accreditation procedures mandated by EPA and the California Department of Health Services.

5.0 FIELD EQUIPMENT

5.1 Preventive Maintenance

All field equipment is to be checked before field operations to allow time for replacement or repair of malfunctioning equipment. WESTON SOPs define the required equipment checks.

5.2 Decontamination

All field sampling equipment must be decontaminated before use and after each sample location in accordance with the Sampling and Analysis Plan. Wash water and other fluids created during decontamination will be containerized if considered hazardous.

6.0 SAMPLING PROCEDURES

Before any sampling event, the field manager must establish the nature of the sampling event, sampling locations, types of samples to be collected, preservation requirements, parameter(s) to be analyzed, sampling procedures, and chain-of-custody requirements. It is extremely important that a correct and detailed sampling and

analysis plan be adhered to for collecting reliable and defensible data.

Procedures for collecting environmental samples are described in the Sampling and Analysis Plan. The exact procedure to be used will be defined in the sampling work plans. A description of the required types of containers, preservation techniques, and holding times for handling the environmental samples after collection and before analyses is presented in Section 9. Exploratory soil borings or sampling during drilling for monitoring well installation samples are to be collected according to ASTM Method D1586-67 and the Sampling and Analysis Plan.

Samples are to be shipped by common carrier and prepared for shipment according to WESTON's SOP 1.5, Guide to the Handling, Packaging, and Shipping of Samples (revision 2). This SOP was developed from U.S. Department of Transportation materials regulations (49 CFR 100-199) and regulations from the International Air Transport Association.

6.1. Soil Boring Procedures

Soil borings may be drilled at the site. Performance of this work will follow the requirements of the Sampling and Analysis Plan. To prevent contamination or cross-contamination of borings during construction, the field manager will ensure that the drilling rig is free from dripping grease or hydraulic fluid, all hydraulic lines are tight, and the rig and auger sections are steam-cleaned before and after each boring is drilled.

7.0 SAMPLE QUALITY CONTROL PROCEDURES

7.1 Field Quality Control

Field quality control data will be collected and examined to ensure samples are not contaminated by an external source. In addition, this field quality control data will be used to support sampling procedures, sample handling, and laboratory analytical results.

Soil Sampling

Trip Blanks	1 per cooler (organics only)
Field Duplicates	1 for every 10 samples

7.2 Laboratory Quality Control

Laboratory quality control requirements are defined by the EPA and California Department of Health Services laboratory certification process.

7.3 Soil Gas Quality Control

Required protocols to be employed during this investigation consist of initial multiple-point calibrations and use of daily standards at the beginning and end of the shift. If a deviation greater than 20% is noted, the calibration curve is to be updated to the daily standard. In addition, replicate samples are to be performed on at least 1 of every 10 samples. Blanks are to be run after standards and samples containing high concentrations to ensure no residual contamination remains in the column.

8.0 SAMPLE CUSTODY

Chain-of-custody forms must be completed and signed by the sampling team member(s). Whenever sample custody is transferred to another sampling team member, laboratory, or shipping company, project field sample custody protocols must be followed. The project chain-of-custody protocols are defined in the Sampling and Analysis Plan. When custody is transferred to a shipping company, the shipping bill number will be printed on the chain-of-custody form.

The sampling team will use sample tags or labels for initiating the chain-of-custody record on the environmental samples. The sample label will include the date, time, sampling location, facility name, sample identification, analysis requested, preservation method, and samplers' initials.

8.1 Laboratory Custody Procedures

When sample containers are provided by WESTON, chain-of-custody documentation will be shipped with the sample containers. These forms should be completed by field personnel with acknowledgment of time and date of transfer and placed in the shipping container in the plastic cover provided.

The following subsections describe laboratory custody procedures associated with sample receipt, storage, preparation, analysis, and general security procedures.

8.1.1 Sample Receipt

- Upon receipt, the sample custodian will inspect sample containers for integrity. The presence of leaking or broken containers will be noted on the chain-of-custody record. The sample custodian will sign (with date and time

of receipt) the chain-of-custody record, thus assuming custody of the samples.

- The information on the chain-of-custody record will be compared with that on sample tags and labels to verify sample identity. Any inconsistencies will be resolved with the field sampling representative before sample analysis proceeds.
- Samples will be moved to one of the locked sample storage refrigerators for storage prior to analysis. The storage location will be recorded on the chain-of-custody record.
- The sample custodian will return the original chain-of-custody record to the Laboratory Data Manager and will provide carbon copies; to each laboratory section manager and one to the main sample log kept in the laboratory.
- The sample custodian will alert the appropriate section managers and analysts of any analyses requiring immediate attention because of short holding times.

8.1.2 Sample Storage

Samples will be maintained in storage in one of the locked storage refrigerators prior to sample preparation and analysis. The storage refrigerators are maintained at $4^{\circ} \pm 2^{\circ}\text{C}$. Analysts request samples for analysis from the sample custodian. Both sign the chain-of-custody record to acknowledge transfer of custody to the analyst.

9.0 ANALYTICAL PROCEDURES

Table 9-1 presents the analysis plan for soil and water samples for the ITT site. The soil samples collected during the investigation will be analyzed using the analytical methods specified in Table 9-1. Any deviation from the methods listed will be documented and approved by the project manager.

10.0 LABORATORY DATA ASSESSMENT PROCEDURES

The quality assurance objectives for precision, accuracy, and completeness were given in Section 3.3. This section will discuss the routine procedures used for assessing those criteria.

The formula for calculating the precision of replicate analyses is given in Section 3.3. All analytical data are reviewed relative to those criteria.

TABLE 9-1
CHEMICALS OF CONCERN AND
ANALYTICAL METHODS

Parameter	Analytical Soil	Methods Water	Limits of Detection*		Sample Container (Aqueous)	Preservative (Aqueous)	Holding Time (Days)
			Soil (mg/kg)	Water (ug/L)			
Acetone	EPA8240 or 8010/8020	EPA624 or 601/602	0.01	100	40 ml vial (2)	4°C	14
2-Butanone (MEK)	EPA8240 or 8010/8020	EPA624 or 601/02	0.01	100	40 ml vial (2)	4°C	14
Chlorobenzene	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	1.2	40 ml vial (2)	4°C	14
1,1-Dichloroethane	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	0.4	40 ml vial (2)	4°C	14
1,1-Dichloroethylene	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	0.7	40 ml vial (2)	4°C	14
Methylene Chloride	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	2	40 ml vial (2)	4°C	14
Tetrachloroethylene	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	0.2	40 ml vial (2)	4°C	14
1,1,2,2- Tetrachloroethane	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	0.2	40 ml vial (2)	4°C	14
Trichloroethylene	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	0.6	40 ml vial (2)	4°C	14
Toluene	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	1	40 ml vial (2)	4°C	14

* Based on a dilution factor of 1.

**0.010/3.7 = soluble/total.

NOTE: All soil samples preserved at 4°C.

WESTON

13 -

TABLE 9-1 (Continued)
CHEMICALS OF CONCERN AND
ANALYTICAL METHODS

<u>Parameter</u>	<u>Analytical Soil</u>	<u>Methods Water</u>	<u>Limits of Detection*</u>		<u>Sample Container (Aqueous)</u>	<u>Preservative (Aqueous)</u>	<u>Holding Time (Days)</u>
			<u>Soil (mg/kg)</u>	<u>Water (ug/L)</u>			
Antimony	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.010/3.7**	0.2	500 ml plastic	4°C HNO ₃ < pH2	180
Arsenic	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.005/5.6	0.005	500 ml plastic	4°C HNO ₃ < pH2	180
Barium	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.020/24.0	0.01	500 ml plastic	4°C HNO ₃ < pH2	180
Cadmium	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.005/2.4	0.005	500 ml plastic	4°C HNO ₃ < pH2	180
Copper	SW3050/SW6010	E200.7	3	0.03	500 ml plastic	4°C HNO ₃ < pH2	180
Chromium	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.010/10.0	0.03	500 ml plastic	4°C HNO ₃ < pH2	180
Cyanide	SW9010	SW9010	20	0.02	500 ml plastic	4°C HNO ₃ < pH2	180

* Based on a dilution factor of 1.

**0.010/3.7 = soluble/total.

NOTE: All soil samples preserved at 4°C.

WESTERN
NORTHWESTERN

TABLE 9-1 (Continued)
CHEMICALS OF CONCERN AND
ANALYTICAL METHODS

<u>Parameter</u>	<u>Analytical</u> <u>Soil</u>	<u>Methods</u> <u>Water</u>	<u>Limits of Detection*</u>		<u>Sample Container</u> <u>(Aqueous)</u>	<u>Preservative</u> <u>(Aqueous)</u>	<u>Holding</u> <u>Time</u> <u>(Days)</u>
			<u>Soil</u> <u>(mg/kg)</u>	<u>Water</u> <u>(ug/L)</u>			
Lead	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.005/4.1	0.005	500 ml plastic	4 ⁰ C HNO ₃ < pH2	180
Mercury	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.0002/0.20	0.005	500 ml plastic	4 ⁰ C HNO ₃ < pH2	180
Nickel	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.040/24.0	0.015	500 ml plastic	4 ⁰ C HNO ₃ < pH2	180
Silver	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.010/8.3	0.03	500 ml plastic	4 ⁰ C HNO ₃ < pH2	180
Vanadium	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.050/11	0.04	500 ml plastic	4 ⁰ C HNO ₃ < pH2	180
Zinc	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.020/7.8	0.01	500 ml plastic	4 ⁰ C HNO ₃ < pH2	180

* Based on a dilution factor of 1.

**0.010/3.7 = soluble/total.

NOTE: All soil samples preserved at 4⁰C.

WESTERN
LABORATORY

For inorganic analyses, the criteria described in Section 3 will be used to assess analytical precision. Corrective action will be taken for any data outside the acceptance criteria.

The calculation of analytical accuracy for organic compounds is given in Section 3.2.2, and the criteria for assessing accuracy for surrogate recoveries outside those criteria will require sample re-analysis.

The criteria for analytical accuracy of inorganic analysis are given in Section 3.2.1. Any accuracy data outside the control limits will require appropriate corrective action.

Completeness has been defined in Section 3.4 as a measure of the amount of analytical data or acceptable quality (i.e., data meeting all accuracy and precision criteria) generated by an analytical method or system. The minimum goal for completeness is 85%, and the ability to exceed this goal is dependent on the applicability of the analytical methods to the sample matrices analyzed.

The initial responsibility for monitoring the quality of an analytical system lies with the analyst. In this pursuit, the analyst will verify that all quality control procedures are being followed, and the quality control samples are within acceptance criteria. This requires that the analyst assess the correctness of the following items, as appropriate:

- Initial calibration
- Calibration verification
- Method blank result
- Duplicate analysis
- Laboratory control standard
- Spiked sample result.

Analytical laboratory performance is documented in WESTON'S Analytical Laboratory Quality Assurance Plan.

11.0 DATA REDUCTION, VALIDATION, AND REPORTING

Data from the analytical laboratory will be reviewed by internal laboratory management before being submitted to the project manager. The laboratory will provide analytical results for blanks and duplicates and recovery data for matrix and surrogate spikes.

Analytical data packages from the analytical laboratory must include the data report, documentation of reduction methods, and related quality assurance/quality control data. These data will be assessed by the data analysis supervisor for compliance with quality assurance/quality control requirements.

Raw data from field measurements and sample collection activities must be recorded in field notebooks or on standard project field forms and appropriately identified. When data have been reduced or summarized, the method of reduction must be documented.

Analytical data, including those from quality control sample analysis, will be entered into the Technical Information Management System. These data will then be statistically evaluated against validation qualifications. If analyses do not meet acceptance criteria, those not exceeding their holding times will be reanalyzed. Those exceeding their holding times will be labelled as unacceptable.

12.0 AUDITS

Audits will be conducted by the project quality assurance manager to verify the existence of a quality control system and evaluate the level of compliance with that system for quality control measures, standards, records, and project documentation and control.

At least one field audit will be performed during each phase of the investigation. In addition, a final audit will be performed at the end of each phase. Most field sampling and associated activities will be audited at least once. Audits will be performed using an audit checklist prepared by quality assurance personnel. Upon audit completion, an audit report containing observations and any findings and associated corrective actions will be submitted to the project manager, project director, and McKenna, Conner, and Cuneo.

13.0 CORRECTIVE ACTION PROCEDURES

The audit team will prepare a formal report of all audit proceedings. The impact of a negative finding, such as the lack of, or failure to use, an appropriate procedure, will be determined by the lead auditor and reported to the individuals identified in Section 12. A corrective action plan and schedule will be requested, and the project manager will be responsible for ensuring that action to correct the nonconformance has been developed, initiated, and any special expertise made available. The project manager will also be responsible for implementing the corrective action and ensuring that no additional work dependent on the nonconforming activity is performed until the nonconformance is corrected. Corrective action may include reanalyzing the samples (if holding time permits), resampling, and evaluating and amending the sampling and analytical procedures.

The project director will be responsible for ensuring that the corrective action adequately addresses the nonconformance. The project manager will ensure that corrective actions for nonconformances are implemented by:

- Evaluating all reported nonconformances,
- Controlling additional work on nonconforming items,
- Maintaining the log of nonconformances, and
- Ensuring nonconformance and correction reports are included in the site documentation files.

Following implementation of satisfactory corrective action, the project manager will conduct follow-up activities sufficient to verify this implementation. Such confirmation will be documented, along with any further recommendations, in a formal closeout report for the audit. The closeout report will be distributed to the individuals identified in Section 12, as appropriate.

All project staff will report suspected nonconformances in field activities by initiating a nonconformance report. This nonconformance report will be submitted to the project manager for formal investigation.

14.0 QUALITY ASSURANCE REPORTS

The project manager and project director will rely on written reports and memoranda documenting data assessment activities, audits, nonconformances, corrective actions, and quality notices to verify that quality assurance requirements are being met.

Records will be kept to document the quality assurance/quality control activities performed and provide support for possible evidential proceedings. All information received from outside sources or developed during the project will be retained by the project team. When an individual task or work assignment is completed, working files will be processed for storage as quality assurance records. The project and field managers will identify which field documents will be designated as quality assurance records for project files. Upon termination of the project, all records (e.g., chromatograms, spectra, and calibration records) will be archived as required. The project manager will ensure that quality assurance records are properly stored and retrievable.

1.0 INTRODUCTION

The data for decision-making and engineering in the program study process are divided into two categories: internal data collected under project requirement and external data collected parallel to and outside the project. To use any data in the program study process requires knowledge to assess the quality of the data and determine their acceptability according to study requirements. Internal data are produced using protocols under the guidelines of the Sampling and Analysis Plan and QA/QC Plan and are subject to audits that verify their acceptability. Historical and external data are not produced under project, so review is required before they can be used in the study. This review is the process of data acceptance.

1.1 Objectives

The objectives of the data acceptance process are listed below.

- Support a cost-effective study process.
- Ensure adequate information to support and defend historical data in litigation proceedings.

These objectives mandate that data will be discarded or accepted only with cause.

1.2 Concepts

The acceptance of data requires either knowledge or review of their relevancy, validity, sufficiency, and integrity. Two of these concepts, validity and sufficiency, are used in an overlapping manner, as defined below.

Relevancy is an initial classification that includes no judgment on the utility of the data, but the potential use of the data in relation to an investigation is examined. A judgment of the validity of data requires an evaluation of the technical correctness, or validity, of the methodology used to acquire the data. The methodology includes the physical/chemical techniques used to collect the data. Ultimately, subsets of data also need to be consistent with the final conceptual model of a site to be conceptually valid.

A judgment of the sufficiency of data requires an evaluation of the availability and adequacy of the data record. Undocumented data may be unacceptable without being invalid. The lack of supporting documentation may mean that the validity of the data cannot be established to the desired degree of certainty, even though they seem to be technically or conceptually valid. Data sufficiency is

also used in the sense that data must be numerous enough to confirm the conceptual model to the desired level of confidence (i.e., they must be conceptually valid). A judgment of the integrity of data depends on whether a chain of custody can be established for data.

1.3 Hierarchical Approach

Data can be organized in a hierarchical manner according to the dependencies of the data. Data can be classified as dependent or independent in terms of data validity and acceptance. Acceptance of data can be approached in a hierarchical manner, beginning with the independent data in the hierarchy. If the independent data are invalid, insufficient, or lack integrity, all of the dependent, hierarchically lower data may be unacceptable. As an example of the hierarchical organization of data, the validity of water quality data depends on the validity of a hierarchy of other data or operations. Several criteria can be used to judge the acceptability of data. These include:

- The sufficiency of data reporting,
- The presence and sufficient documentation of quality assurance/quality control,
- The presence and documentation of custody, and
- The validity of sampling and analysis methodology.

These acceptance criteria may be applied in a hierarchical manner by sequentially using them in the evaluation of each tier in the hierarchical organization of data.

The hierarchical organization of data facilitates the logical, efficient validation and acceptance of those data. If data can be shown to be invalid or unacceptable at a given point in the hierarchy, dependent data lower in the hierarchy do not have to be evaluated. Evaluation of data in a hierarchical manner also ensures that data are reviewed, not only for intrinsic validity or acceptability, but also for acceptability based on their dependence on other data.

The data-acceptance process includes consideration of the relative importance of data and specific requirements for accuracy and precision based on data type. Technical criteria are applied to data in a more or less rigorous manner depending on how critical the data are, which is determined by their use and location. An example of this concept is the comparison between well-completion data for a domestic well and a monitoring well. The acceptance of groundwater quality data is dependent on the acceptance of

well-completion data. Groundwater quality data for a domestic well, for which there was little information on completion, may still be acceptable because of its relevancy in assessing risk for users of that particular well. Conversely, groundwater quality data for a monitoring well where there was little information on completion would probably be useful only for reconnaissance.

An example of the data-specific requirements for accuracy and precision is the measurement comparison between the top of a sandpack around a monitoring well and the water levels in the well. It is practical to measure the elevation of a sandpack to only about 1 ft, and an accurate measurement with that precision is adequate to judge the usefulness of the well. However, water levels in that same well that would be used to depict potentiometric surfaces, to calculate hydraulic gradients, and for computer simulations require a precision more accurate than 1 ft.

The data acceptance process may consider the abundance of data. For example, the elevation of a lithologic layer at a point based on only three borehole logs that lack supporting documentation would probably be unacceptable. The elevation of the same lithologic layer at the same point, if based on several tens of borehole logs that could cross-correlate each other, may be acceptable. In considering the abundance of data, the possibility of a systematic error will be carefully considered. For example, abundant laboratory analytical data that lack critical supporting documentation would be suspect for a systematic error.

1.4 Level Classification

Data that cannot be completely accepted may still be classified as other than unacceptable. Depending on the intended use, they may be classified in the following manner.

- Acceptable: fully acceptable for all uses.
- Reconnaissance: usable for reconnaissance (for example, to indicate the possible presence of a potential environmental contamination problem).
- Unacceptable: data with serious flaws that prevent their use in the conceptual model, especially ambiguity or a lack of essential components (for example, a total absence of location description).
- Unknown: data not yet evaluated in terms of acceptability is classified as unknown during the evaluation.

Data may be completely unacceptable, even for reconnaissance use. The reason for finding data completely unacceptable would be the

presence of uncorrectable errors or ambiguities in the data. Data would be classified as unknown until a classification could be completed and data transcribed from their source (for example, reports of historical data) onto standard forms. A data acceptance form is used to document changes in the classification of data.

2.0 THE ACCEPTANCE PROCESS

The process of accepting data can be viewed in a linear fashion. The process is iterative in that various steps in the process result in a return to previous steps.

2.1 Identification of Data

The precursor to the data-acceptance process is the identification of data, which is a discovery process where multiple inquiries are made. The initial guidelines on the identification of data should be based on data needs.

2.2 Relevancy of Data

After data are identified, it must be determined if they are relevant to the respective project investigation. The determination of relevancy requires a conceptual model of the remedial investigation and an understanding of the relationships among different data. These requirements are due to several complexities of remedial investigations, including the facts listed below.

- Both environmental and nonenvironmental data may be used in a remedial investigation.
- Not all environmental data may have relevance to the project or to a particular remedial investigation.
- Data may not be directly related to a remedial investigation, but may be relevant if they support directly related data.

The determination of relevancy at this step in the data-acceptance process is a gross screening to reduce the amount of data examined in more detail. Data may be judged irrelevant at this step. They may later be recognized as relevant when it is discovered that they have a relationship to other relevant data. Therefore, the determining relevancy is an iterative process.

2.3 Organization

After the gross screening of data for relevancy, the data are organized in a logical manner. The organization may include grouping the data into related subsets and defining the relation-

ships among all data. The organization of data has the advantages of facilitating the acceptance process for groups of data, as opposed to an individual basis, and facilitating the use of the hierarchical approach to data acceptance by defining the dependencies of data.

2.4 Prescreening of Data

Before an itemized review of the data, they are subject to a prescreening. The objective of the prescreening is to use key criteria to screen out reconnaissance level or unacceptable data with a minimum of effort. These key criteria are grouped into two major areas, quality assurance/quality control and integrity.

2.4.1 Quality Assurance/Quality Control

This project includes a quality assurance/quality control program. If it can be established that data were obtained under the auspices of a quality assurance/quality control programs that were functionally equivalent to this quality assurance/quality control plan, historical and recent external data can be used in this project. The functional equivalence of a quality assurance/quality control program should be determined by a comparison of the quality assurance plan and the sampling and analysis plan for historical or recent external data with the current quality assurance/quality control plans and work plans. Some criteria that should be used in determining functional equivalence are listed below.

- Are quality assurance/quality control documentation available for a particular data set? If available, is the quality assurance/quality control documentation equivalent to the project protocols?
- Were quality assurance audits conducted? If conducted, were they completed at appropriate frequencies?
- Did the quality assurance/quality control program include the use of protocols such as blanks and spikes and other quality control samples? If so, were such samples used at an appropriate frequency?
- Were the data collected under the auspices of a sampling plan, and were the data collected in a consistent manner (possibly with standard operating procedures)?
- Were analytical data developed under the auspices of a sampling plan, and did the analytical laboratory use standard operating procedures? Did the analytical laboratory have a quality assurance/quality control manual?

It is not necessary to complete an exhaustive review of quality assurance/quality control documentation to accept a data set. The data set may be accepted through a process of spot checks (audits) to verify that representative samples of the data are documented by quality assurance/quality control protocols that are functionally equivalent to project protocols.

2.4.2 Integrity

An evaluation of the integrity of data is predominantly a review of whether custody can be established for the data. It may be possible to physically obtain or review chain-of-custody forms. In that case, data could be fully acceptable. It would not be required to review chain-of-custody forms for every sample, but at a minimum, it should be established that a chain of custody was maintained.

As an example of an alternative, there could be data where it is not possible to actually review chain-of-custody documentation, but there is evidence that a custody program was conducted. This evidence could support monitoring plans specifying that a custody program was followed through documentation by audit reports. Such data could be classified as marginally acceptable and verified by selected resampling.

After the completion of the prescreening, the data can be loaded into an automated database. The database can then be used to complete quantitative reviews and expedite more thorough qualitative reviews.

2.5 Completeness

The initial steps in the data-acceptance process are qualitative operations. The determination of the completeness is a more objective operation. The completeness of data distinguishes between subsets of the data that are essential to any use of the data and nonessential subsets that are important, but without which the data are still usable. The presence or absence of nonessential subsets can make a difference in the classification of the data into various levels of acceptability. The completeness or incompleteness of data also depends upon the use of the data.

An example of an essential data subset would be the casing elevation of a well used for precise water-level measurements. In the absence of a surveyed casing elevation, but using an approximation, the water level cannot be determined to the requisite accuracy and precision. An example of a nonessential data subset would be the casing elevation for a domestic well where the water level is not essential information, although the water quality is essential.

The determination of completeness must be made on an individual basis for each datum. It is not amenable to gross screening, as are some other steps in the data-acceptance process. If historical or recent external data are presented in tabular format, it is possible to expeditiously review the data for gaps. Otherwise, an appropriate way to judge completeness is to transcribe the historical and recent external data from their existing presentation format(s) onto standard forms. Completeness can also be determined through the hierarchical approach, thereby minimizing the effort required in review and transcription.

2.6 Quantitative Review

The quantitative review of data involves the application of several quantitative measures to evaluate the relevancy and validity of the data. If the data are loaded into a computer database, the application of these quantitative measures can be accomplished in an automated manner. The computer database should be linked to a processor with analytical capabilities. Some quantitative measures are described below.

- It can be quantitatively determined whether the data are real (valid) in the sense that they fall within the known physical range of the particular data type. As an example, a pH measurement greater than 14 would not be real.
- It can be determined if data are within a quantitative range that determines relevance. As an example, for an investigation of a surficial groundwater system, wells greater than 200 ft in depth could be completed in a separate aquifer. Data associated with these deep wells, including dependent data, could be irrelevant to the investigation.
- It can be quantitatively determined whether data have ambiguities or errors. As an example, a cation-anion balance could be calculated for water-quality data. If the balance did not fall within prescribed limits, it would be known that one (or more) of the individual analyses used in the balance was inaccurate.
- It can be quantitatively determined if data are consistent with established data quality objectives.

2.7 Technical Validity

The technical validity of data relative to the project is determined by comparing the sampling and analysis methods through which

the data were obtained with the sampling and analysis methods specified. This comparison determines whether the data were collected and analyzed using technically valid methods.

During the review of quality assurance/quality control, technical validity is determined if the sampling and analysis process included the use of blanks, spikes, matrix spikes, matrix spike duplicates, or other quality control samples. If not, the data are classified at that step as reconnaissance. To evaluate the technical validity of data sets where quality control samples were used, it is necessary to review quantitative results of the quality control samples. This operation overlaps with the quantitative review of data discussed above, and is facilitated by the use of an automated database and associated processor.

The technical validity of data may involve the evaluation of the data on a statistical basis. The objective of the statistical evaluation is to determine whether the data constitute a statistically valid sample population. This evaluation may be accomplished by actual manipulation of the data set and the review and evaluation of a sampling plan that specifies the sampling strategy used to collect the samples. Therefore, the evaluation may be either a qualitative or a quantitative evaluation. It supports the evaluation of the conceptual validity of the data.

2.8 Conceptual Validity

The final step in the acceptance process is to evaluate the validity of the data with respect to the conceptual model of the site to determine if the data support or contradict the existing conceptual model. If the data contradict the conceptual model, one must

- Find the review data unacceptable, based on the overwhelming evidence of other accepted data;
- Gather additional data to rectify ambiguities in the conceptual model; or
- Change the conceptual model based on the data under review, which must constitute overwhelming evidence against the data used to formulate that conceptual model.

Statistical techniques may be used in a screening to compare data sets. Statistical evaluation may include the application of techniques to determine the sufficiency of data.

The ultimate determination of the conceptual validity of data requires a comprehensive use of the data as input to various techniques that support the conceptual model. These techniques

range from the simplest data reduction to numerical modeling. The comprehensive utilization of data sets is a means of determining the internal consistency of data.

ATTACHMENT B
QUALITY/ASSURANCE/QUALITY CONTROL
DEFINITIONS



QUALITY ASSURANCE/QUALITY CONTROL DEFINITIONS

Quality Assurance - The system of planned or systematic actions taken to provide adequate confidence that a product or service (in this case, good quality data) meets or satisfies given needs.

Quality Control - The system of activities designed and implemented to provide a quality product. For example, the routine activities and checks performed during the course of work that builds quality into the product.

Audit - Audits are the formal vehicle used to verify compliance with all aspects of the Quality Assurance program and to determine its effectiveness.

Chain of Custody - Inventory control information that when documented attests to the integrity of data (sample(s)) collected.

Internal Quality Control - The routine activities and checks, such as periodic calibrations, duplicate analyses, and the use of spiked samples, that are included in normal internal procedures to control the accuracy and precision of a measurement process.

Standard Operating Procedures (SOP) - A written document that describes an operation, analysis, or action in which mechanisms are thoroughly prescribed and commonly accepted as the method for performing certain routine or repetitive tasks.

Statistics

Comparability - A measure for the confidence that one data set can be compared to another.

Completeness - The amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under correct normal operations, usually expressed as a percentage.

Test Variability

Accuracy - The degree of agreement for a measurement with an accepted reference or true value, usually expressed as the difference between the two values.

Analytical or Reagent Blank - A blank used as a baseline for the analytical portion of a method. For example, a blank consisting of a sample from a batch of absorbing solution used for normal samples that is processed only through the analytical system and used to adjust or correct routine analytical results.

Blank or Sample Blank - A sample of a carrying agent (gas, liquid, or solid) normally used to selectively capture a material of interest. The blank or sample is subjected to the usual analytical or measurement process to establish a zero baseline or background value and is used to adjust or correct routine analytical results.

Calibration - Establishment of a relationship between various calibration standards and the measurements of them obtained by a measurement system or portions of the system. The levels of the calibration standards should bracket the range of levels obtained when actual measurements are to be made.

Calibration Standard - A standard used to quantitate the relationship between the output of a sensor and a property to be measured. Calibration standards should be traceable to Standard Reference Materials, Certified Reference Materials, or a primary standard.

Certified Reference Materials - A material produced in quantity when certain properties have been certified to the extent possible to satisfy its intended use by the National Bureau of Standards or other agencies.

Equipment Blank - A blank that is prepared by collecting water that has been run over the sampling equipment before use. This will determine if the samples were contaminated by the sampling equipment.

Field Blank - A blank that is prepared, handled, and analyzed in the same manner as normal carrying agents, except that it is not exposed to the material to be selectively captured.

Minimum Detectable Level (Limit of Detection) - The limit of detection for an analytical method is the minimum concentration of the constituent or species of interest that can be observed by the instrument and distinguished from instrument noise with a specified degree of probability.

Precision - A measure of mutual agreement among individual measurements of the same property, usually under prescribed similar conditions. Precision is most desirably expressed in terms of the standard deviation, but can be expressed in terms of the variance, range, or other statistic. Measures of precision must be qualified or explained in terms of possible sources of variability to make them meaningful and useful.

Replicate Analysis - Repeated, but independent, determinations of the same sample by the same analyst, at essentially the same time and under the same conditions.

Reproducibility - The precision, usually expressed as a standard deviation, measuring the variability among results of a measurement of the same sample at different laboratories.

Sensitivity - The degree by which an instrument (or method) can detect a particular compound.

Spiked Sample - A normal sample of material (gas, solid, or liquid) to which is added a known amount of some substance of interest. The extent of the spiking is unknown to those analyzing the sample. Spiked samples are used to check on the performance of a routine analysis or the recovery efficiency of a method.

Traceability - A documented chain of comparisons connecting a working standard to a national standard, such as a standard maintained by the National Bureau of Standards (NBS).

Trip Blank - A blank that is included in the shipping container to determine if samples are being contaminated by the shipping container during shipment.

Appendix D

APPENDIX D

HEALTH AND SAFETY PLAN



HEALTH AND SAFETY PLAN
FOR
ITT FACILITY
BURBANK, CALIFORNIA

2 November 1989

W.O. No. 2588-08-01

Prepared by:

Roy F. Weston, Inc.
1350 Treat Blvd., Suite 200
Walnut Creek, California 94596

HEALTH AND SAFETY PLAN**TABLE OF CONTENTS**

<u>Section</u>	<u>Description</u>	<u>Page</u>
1.0	Introduction	1
2.0	Work Location Description	3
3.0	Health and Safety Responsibility	3
4.0	Medical Monitoring Program	4
5.0	Training	4
6.0	Emergency Contacts	5
7.0	Exposure/Injury Reports	6
8.0	Major Chemicals of Concern	6
9.0	Physical Hazardous of Concern	6
10.0	Levels of Protection	7
11.0	Action Levels	7
12.0	Site Control Techniques	8
13.0	General Safety Guidelines	9
14.0	Specific Protective Measures for Each Activity	10
15.0	Decontamination	11



ITT BURBANK FACILITY HEALTH AND SAFETY PLAN

WESTON Work Order Number 2588-08-01

PRIMARY EMERGENCY CONTACTS

The following Primary Emergency Contacts are to be utilized in the event of an on-site emergency:

<u>Name and Location</u>	<u>Telephone</u>
Ambulance	911
Hospital (Map Attached) St. Joseph Medical Center 2727 Alameda Avenue Burbank, CA	818-843-5111
Police	911
Fire Dept.	911
Site Phone ITT Facility Theresa Holcomb Site Coordinator	818-953-2119
WESTON Hot Line (SPER) 24 Hour	215-524-1925 215-524-1926
WESTON Headquarters	215-692-3030
Medical Emergency-24 Hour Toxicological Information Service	513-421-3063
Environmental Emergency (National Response Center)	800-424-8802
EPA-ERT Emergency	201-321-6660
Center for Disease Control (CDC) - Day Night	404-329-3311 404-329-3644
CHEMTREC	800-424-9300
Poison Control Center	800-962-1253
National Pesticide Center	800-845-7633
Closest WESTON Office - Woodland Hills, CA	818-596-6900

Directions to Hospital: Proceed 1/4 mile northeast on Flower to Alameda. Turn left on Alameda for approximately 1-3/4 mile to Buena Vista Street. Hospital is on the corner of Alameda and Buena Vista (figure 1).

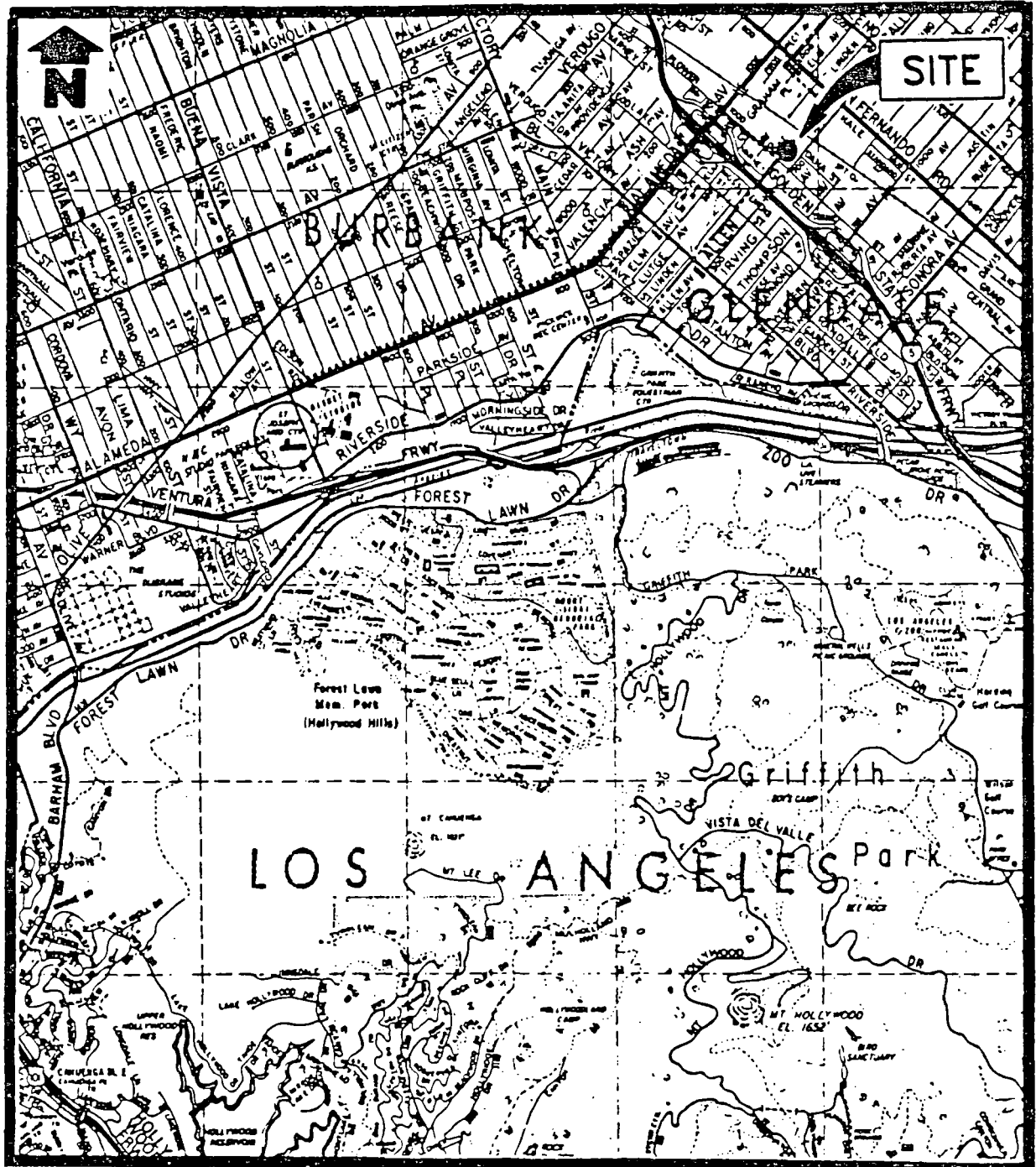


Figure 1. Route to hospital.

1.0 INTRODUCTION

The purpose of this document is to define specific health and safety procedures and protocols that will be implemented on all WESTON personnel and their subcontractors during completion of field activities at the ITT facility. The information contained in this document is proprietary and cannot be released or duplicated without written permission. As stated previously, this safety plan applies to all WESTON subcontractors. In addition, visitors to WESTON work locations at the ITT facility will be asked to adhere to WESTON Health and Safety protocols. Any deviations from the WESTON Health and Safety Plan or program will be noted in WESTON's site log. Consideration was given to the following references during development of this plan: Roy F. Weston Health and Safety protocols; current safety standards as dictated by OSHA/NIOSH; health effects and standards for known chemicals of concern; and procedures designed to account for the potential to encounter unknown substances.

2.0 WORK LOCATION DESCRIPTION

The ITT facility is an active manufacturing facility located in San Fernando Valley. The plant has utilized a variety of process operations in the production of instrumentation and control housings and castings, and has been in operation since the 1950's.

The site is situated in a mixed industrial and commercial area. The property is entirely fenced in with guarded gates on the west and south sides. Most of the buildings are located on the south and central part of the site, and the north portion is used for parking. The topography is flat, but excavation and demolition activities have left open trenches, debris and uneven footing. Weather is generally mild year-round except for hot periods during the summer months and Santa Ana conditions.

3.0 HEALTH AND SAFETY RESPONSIBILITY

WESTON will provide an individual to serve as Site Health and Safety Coordinator (SHSC). That individual will be responsible for assuring that all personnel and activities are in conformance with the protocols defined in this document. The SHSC will have complete control over Health and Safety matters on-site. He or she may at any time stop operations if Health and Safety procedures are being compromised or are not sufficient. The SHSC maintains contact with WESTON's Corporate Health and Safety Director.

WESTON's Project Director and Project Manager are ultimately responsible for ensuring the Health and Safety of WESTON

employees and subcontractors on this project. In regards to site work at ITT facility, the Corporate Health and Safety Director will review and approve this document. In addition, he will serve an audit function in order to ensure that the defined protocols are being implemented in the field.

The following is a simplified schematic diagram displaying the Health and Safety chain of command within WESTON:

George M. Crawford
Corp. H&S Director

Robert P. Schoenfelder
Regional H&S Director

Steve Werner
Officer-in-Charge

Lynne Preslo
Project Director

Sue Kraemer
Site Manager

Jeff Bannon
SHSC/Site Manager

A list of WESTON personnel expected on site and their current safety status is included as an attachment.

4.0 MEDICAL MONITORING PROGRAM

In compliance with OSHA protocols, all personnel will be enrolled in a Medical Monitoring program. All WESTON personnel are required to maintain current medical status with an annual physical. All subcontractors to WESTON will be required to have a medical monitoring program in place. All site personnel will have had a physical within the last 11 months.

5.0 TRAINING

All WESTON personnel are required to attend a 40-hour safety training as outlined in the SARA guidelines. This course certified personnel to perform various activities in potentially hazardous locations in EPA designated levels of protection B and C. In order to serve as an SHSC, an individual must have the following: additional on-the-job-training (>24 hours on site in the prescribed level of protection); probationary status on one site; current first aid and CPR certification; and final approval by WESTON's Corporate Health and Safety Director.

7.0 EXPOSURE/INJURY REPORTS

In the case of an injury or exposure, an incident report will be filed with WESTON's Corporate Health and Safety Director. A copy of that report will be filed with the appropriate ITT personnel. A copy of the WESTON Exposure/Injury Report is attached. If an injury or exposure occurs, the specific incident will be reported to the SHSC. The SHSC will immediately notify WESTON's Corporate Health and Safety Director. The SHSC will ensure that exposure/injury reports are completed. Upon completion of an incident report, WESTON's Health and Safety Department will conduct an investigation to determine the cause of the exposure/injury, and recommend measures to prevent reoccurrence of the incident.

8.0 MAJOR CHEMICALS OF CONCERN

Table 1 presents general information for major chemicals previously identified at the ITT facility, and that may be potentially encountered during the field investigation. The information includes exposure limits and recommendations, routes of exposure, typical signs and symptoms of exposure and ionization potentials. Levels of protection and monitoring requirements for specific field activities at ITT facility will be based on data contained in Table 1, previously measured concentrations of chemicals in the soil, direct instrument readings, and results of the soil-gas screening.

9.0 PHYSICAL HAZARDS OF CONCERN

The primary physical hazards are those associated with drilling operations (ie., falling objects, moving parts, heavy lifting, improperly maintained equipment, traffic, noise). These hazards can be mitigated by inspecting equipment for signs of wear (frayed cables and lines, worn parts), maintaining proper usage (use outriggers, wheel chocks), and by discussing possible dangers during the morning briefings.

Other potential drilling hazards are overhead and underground utilities. To mitigate this hazard, all boring locations will be cleared by plant personnel prior to drilling. Additionally, initial drilling will begin very slowly to approximately ten feet, and the driller will be alerted to stop immediately upon encountering underground objects.

Debris and open trenches remaining from excavation and demolition activities are potential physical hazards. Injury from these hazards can be mitigated by alerting personnel to those areas and ensuring adequate lighting is available.

Heat stress is a likely physical hazard especially when working in protective clothing. Site controls to avoid heat stress include proper monitoring of vital signs, maintaining fluids, adjusting the work/rest ratio, and providing shelter. Protocols to be employed on site are included in the attachments.

10.0 LEVELS OF PROTECTION

Levels of protection used at the ITT site will depend on the location and nature of the activity, and will be evaluated individually based on the existing chemical data base and direct instrument readings. Levels of protection as prescribed in this document may be modified by the SHSC according to specific field conditions.

Level D

Steel toe/shank boots
Surgical gloves when handling media
Cotton work gloves (when necessary)
Hard hat

Level C

Cotton coveralls (or equivalent)
Tyvek (If raining, polytyvek or rain suit)
Air purifying respirators (full-face NIOSH/OSHA approved)
MSA GMC-H (or equivalent) cartridge
Steel toe/shank boots
Latex boot covers or steel-toed rubber boots
Surgical gloves
Nitrile outer gloves
Hard hat

Level B

Cotton coveralls (or equivalent)
Tyvek (polytyvek or saranex if chance of encountering liquids)
Air supplied respirators
Steel toe/shank boots
Latex boot covers or steel-toed rubber boots
Surgical gloves
Nitrile outer gloves
Hard hat

11.0 ACTION LEVELS

Action levels for each activity will be evaluated separately based on available chemical data and direct instrument readings. The organic action levels are based on readings

obtained on an HNu Photoionization Detector equipped with an 11.7 ev probe. These readings will be supplemented by colorimetric tubes specific for compounds with low exposure levels (TLV, PEL or REL) and that are known or suspected to occur near the activity.

The explosive action levels are based on readings obtained with an explosimeter and % oxygen detector.

Explosive Action Levels

Explosimeter <10% L.E.L (Lower Explosive Limit) -
Continue to work

10% to 25% L.E.L - Continue monitoring and work with extreme caution

>25% L.E.L. - Evacuate work site

Oxygen Meter 19.5% to 25% - Continue work

<19.5% or >25% - Evacuate work site

Organic action levels are based on monitoring performed in the breathing zone. The breathing zone is the area at nose/mouth height where personnel are working. Explosive action levels apply to monitoring performed anywhere in the work area.

Real-time readings of metal concentrations in dust is not possible, so levels of protection will need to be employed in those areas known to contain elevated metals levels, and areas where known metal processing occurred. These areas will be evaluated individually following completion of the work plan.

12.0 SITE CONTROL TECHNIQUES

Each work location will be divided into three distinct work zones. Definition of these locations will be accomplished via banner guard or rope. The work zones are as follows:

Zone 1: Exclusion Zone - the zone where chemicals of concern do or could exist. All personnel entering the exclusion zone must wear the level of protection specified for that work area. The number of personnel in this zone will be controlled and minimized.

- Zone 2: Contamination Reduction Zone (CRZ) - provides a transition zone between the Exclusion Zone and the Support Zone to prevent the spread of chemicals of concern from the Exclusion Zone. Decontamination is performed in this zone.
- Zone 3: Support Zone - area or work site considered to be non-contaminated (located upwind of the Exclusion Zone). This is storage area for support equipment and provides a point of personnel access and traffic control to the CRZ and Exclusion Zone.

13.0 GENERAL SAFETY GUIDELINES

- o Site personnel should sign a master sheet indicating they have read the site safety plan and will comply.
- o There will be no eating, drinking, or tobacco use in the exclusion or contamination reduction zone.
- o All personnel must pass through the contamination reduction zone to enter or exit the exclusion zone.
- o As a minimum, emergency eye washes will be on the contaminated side of the contamination reduction zone and/or at the work station.
- o Fire extinguishers will be on site for use on equipment or small fires only.
- o An adequately stocked first aid kit will be on scene at all times during operation hours.
- o A morning safety meeting will be conducted for all site personnel. The safety procedures and the day's planned operations should be discussed.
- o No drilling activities will be conducted during thunderstorms or lightning storms as determined by the SHSC.
- o All visitors and unnecessary personnel will remain in the Support Zone at a minimum of one boom length distance from the drill rig.
- o All personnel should wash hands thoroughly after exiting the work zone.

14.0 SPECIFIC PROTECTIVE MEASURES FOR EACH ACTIVITY

The following subsections describe general monitoring schemes for each site activity. As noted, specific levels of protection and monitoring schemes will be evaluated individually for each activity and each location when the scope of work is finalized.

Soil-gas Screening

Soil-gas sampling involves two basic steps; probe installation and sample collection. Probe installation is an intrusive activity which may require an upgraded level of protection, once again dependent upon the location. Concrete will need to be removed or drilled out in many areas for probe installation. Of all the soil-gas sampling activities, this procedure has the highest potential of releasing volatiles and stirring up dust. Therefore, direct instrument monitoring will be conducted during this phase of the sampling.

The actual driving of the probe should not release volatiles, but may stir up dust. Levels of protection for this activity will be dependent upon metals data available and upon direct instrument readings obtained during the concrete-removal stage.

Sample collection is the least intrusive activity of the soil-gas screening and probably will not require upgraded levels of protection. However, upgraded levels of protection will be initiated if protection were necessary during probe installation; and based on the location of specific probes in or adjacent to suspected sources.

Soil Boring/Sampling

Soil boring/sampling is an intrusive activity which may require upgraded levels of protection. Air quality monitoring will be performed during all drilling phases. Initial levels of protection will be determined on an individual basis depending on the results of previous investigations and the soil-gas data.

Air quality monitoring will be performed with the HNU photoionization detector (11.7 ev probe). A combination explosimeter and % oxygen detector equipped with an automatic intake pump and audible alarm will be placed on the ground, adjacent to and downwind of the boring locations.

HNU readings will be taken periodically, approximately every five feet of depth, and randomly. Soil samples, the

borehole/auger opening and the breathing zone will be monitored. In addition, colorimetric tubes specific for volatile compounds of concern will be utilized to screen for these compounds. Protocols for upgrading the level of protection have been outlined in section 10.0, Action Levels.

15.0 DECONTAMINATION

The following decontamination sequences will be utilized for level C protection:

Level C Decontamination

- Step 1 Remove and dispose of outer boot covers and/or wash and rinse rubber boots.
- Step 2 Wash, rinse and remove outer gloves.
- Step 3 Remove chemical resistant coveralls.
- Step 4 Remove air purifying respirator.
- Step 5 Remove inner gloves.
- Step 6 Wash and rinse hands.

Level B Decontamination

- Step 1 Remove and dispose of outer boot covers and/or wash and rinse rubber boots.
- Step 2 Wash, rinse and remove outer gloves.
- Step 3 Remove chemical resistant coveralls.
- Step 4 Remove air supplied respirators.
- Step 5 Remove inner gloves.
- Step 6 Wash and rinse hands.

TABLE 1
Major Chemicals of Concern
ITT Facility

Chemical	Exposure Limit	IDLH Level	Route of Exposure	Typical Symptoms Exposure	Ionization Potential
<u>Volatile Organic Compounds</u>					
Acetone	TLV=750ppm	20,000ppm	Inhalation, ingestion, skin and/or eye contact	Irritates eyes-nose-throat headache, dizziness, dermatitis	9.96 ev
2-Butanone (MEK)	TLV=200ppm 10-hr. TWA=250ppm	3,000	Inhalation, ingestion, contact	Irritates eyes-nose, headache, dizziness, vomiting	9.96 ev
Chlorobenzene	TLV=75ppm	2,400	Inhalation, ingestion, contact	Irritates skin-eyes-nose, drowsiness, incoordination, liver damage	9.07 ev
1,1-Dichloroethane (1,1 DCA)	TLV 100ppm	4,000	Inhalation, ingestion, skin and/or eye contact	Skin irritation, drowsiness	—
1,1-Dichloroethylene	TLV=200ppm	4,000	Inhalation, ingestion, skin and/or eye contact	Central nervous system depression skin irritant, drowsiness, unconsciousness, liver and kidney damage	9.46 ev
Methylene chloride	TLV=50ppm (proposed) PEL=500ppm REL=As low as possible	Carcinogen	Inhalation, ingestion, contact	Fatigue, weakness, light-headedness, limbs numb-tingle, nausea, irritates eyes-skin, vertigo, worsen angina	11.35 ev
Tetrachloroethylene (PCE)	TLV=50ppm PEL=100ppm REL=As low as possible	Carcinogen	Inhalation ingestion, contact	Irritates eyes-nose-throat, nausea, flush, neck-face, vertigo, dizziness, incoordination, headache, somnolence, erythemia	9.32 ev
1,1,2,2-Tetrachloroethane	TLV=1ppm PEL=5ppm REL=Lowest detectable	Carcinogen	Inhalation ingestion, absorption,	Nausea, vomiting, abdominal pain, tremor fingers, jaundice,	11.10 ev

TABLE 1
Major Chemicals of Concern
ITT Facility

Chemical	Exposure Limit	IDLH Level	Route of Exposure	Typical Symptoms Exposure	Ionization Potential
	limit		contact	enlarged tender liver, dermatitis, monocytosis, kidney damage, paresthesia	
Trichloroethylene (TCE)	TLV=50ppm PEL=100ppm 10-hr. TWA=25ppm	Carcinogen	Inhalation ingestion, contact	Headache, vertigo, visual disturbance, tremors, somnolence, nausea, vomiting, irritated eyes, dermatitis, cardiac arrhythmias, paresthesia	9.45 ev
Toluene	TLV=100ppm 10-hr. TWA=100ppm 10-min. ceil=200ppm	2,000ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Fatigue, weakness, confused, dizziness, headache	8.82ev
<u>Metals</u>					
Antimony	TLV=0.5 mg/m	80mg/m	Inhalation, contact	Irritated nose-throat-mouth-skin, cough, dizziness, headache, nausea, vomiting, diarrhea, cramps, insomnia, anorexia, loss of smell, cardiac	—
Arsenic	TLV=10ug/m	Carcinogen	Inhalation, absorption, contact, ingestion	Ulceration of nasal septum, dermatitis, GI disturbances, peripheral neuropathy, respiratory irritation, hyperpigment of skin	—
Barium	TLV=0.5 mg/m	250mg/m	Inhalation, ingestion, contact	Upper respiratory irritation, GI, muscle spasms, slow pulse, extrasystoles, hypokalemia, irritated eyes, skin burn	—
Cadmium	TLV=0.05mg/m3 PEL=0.2 mg/m3	Carcinogen	Inhalation, ingestion,	Pulmonary edema, dyspnea, cough,	

TABLE 1
Major Chemicals of Concern
ITT Facility

Chemical	Exposure Limit	IDLH Level	Route of Exposure	Typical Symptoms Exposure	Ionization Potential
	Ceil=0.6mg/m3			tight chest, substernal pain, headache, chills, muscle aches, nausea, diarrhea, emphysema, proteinuria, anemia	
Copper	TLV=1mg/m3	N.A.	Inhalation, ingestion, contact	Irritates mucous membrane—pharynx, nasal perforation, eye irritation, metal taste, dermatitis.	—
Chromium (Assume worst case; carcinogenic hexavalent)	10-hr. TWA=1ug/m3	Carcinogen	Inhalation, ingestion, contact	Respiratory—nasal septum irritation, leukocytosis, leukopenia, monocytosis, eosinophilia, eye injury, conjunctivitis, skin ulcer and sensitivity	—
Cyanide	TLV=5mg/m3 REL ceil=5mg/m3	50mg/m3	Inhalation, absorption, ingestion, contact	Asphyxia and death can occur, weakness, headache, confusion, nausea, vomiting, slow gasping respiration, eye—skin irritation	—
Lead	TLV=0.05Mmg/m3	N.A.	Inhalation, ingestion, contact	Lassitude, insomnia, pallor, eye grounds, anorexia, low-weight, malnutrition, constipation, abdominal pain, colic hypotense, anemia, gingival lead line, tremors, paralysis wrist	—
Mercury	TLV=0.05mg/m3 PEL ceil=0.1mg/m3	28mg/m3	Inhalation, absorption, contact	Cough, dyspnea, bronchial pneumonia, tremor, insomnia, irritability, indecision, headache, fatigue, weakness,	—

TABLE 1
Major Chemicals of Concern
ITT Facility

Chemical	Exposure Limit	IDLH Level	Route of Exposure	Typical Symptoms Exposure	Ionization Potential
				stomatitis, salivation, GI, anorexia, low-weight, proteinuria, irritated eyes-skin	
Nickel	TLV=1mg/m3 (metal) =0.1mg/m3 (soluble)	Carcinogen	Inhalation, absorption, contact	Sensitivity dermatitis, allergic asthma, nasal cavities, pneumonitis	—
Silver	TLV=0.1mg/m3 (metal) =0.01mg/m3 (soluble)	N.A.	Inhalation, absorption, contact	Blue-gray eyes-nasal septum-throat-skin, irritated-ulcerated skin, GI	—
Vanadium	TLV=0.5mg/m3 15-min REL ceil=0.05mg/M3	70 mg/m3	Inhalation, absorption, contact	Irritated eyes-throat, green tongue, metal taste, cough, fine rales, wheezing, bronchitis, dyspnea, eczema	—
Zinc (as zinc oxide)	TLV=5mg/m3	N.A.	Inhalation	Sweet metal taste, dry throat, cough, chill, fever, dyspnea, rales, low pulmonary function, headache, blurred vision, back pain, nausea, vomiting, fatigue	—

ATTACHMENT 1

HEAT STRESS PROTOCOLS

Heat Stress and Other Physiological Factors

Wearing PPE puts a hazardous waste worker at considerable risk of developing heat stress. This can result in health effects ranging from transient heat fatigue to serious illness or death. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, workload, and the individual characteristics of the worker. Because heat stress is probably one of the most common (and potentially serious) illnesses at hazardous waste sites, regular monitoring and other preventive precautions are vital.

Individuals vary in their susceptibility to heat stress. Factors that may predispose someone to heat stress include:

- Lack of physical fitness.
- Lack of acclimatization.
- Age.
- Dehydration.
- Obesity.
- Alcohol and drug use.
- Infection.
- Sunburn.
- Diarrhea.
- Chronic disease.

Reduced work tolerance and the increased risk of excessive heat stress is directly influenced by the amount and type of PPE worn. PPE adds weight and bulk, severely reduces the body's access to normal heat exchange mechanisms (evaporation, convection, and radiation), and increases energy expenditure. Therefore, when selecting PPE, each item's benefit should be carefully evaluated in relation to its potential for increasing the risk of heat stress. Once PPE is selected, the safe duration of work/rest periods should be determined based on the:

- Anticipated work rate.
- Ambient temperature and other environmental factors.
- Type of protective ensemble.
- Individual worker characteristics and fitness.

Monitoring

Because the incidence of heat stress depends on a variety of factors, all workers, even those not wearing protective equipment, should be monitored.

- For workers wearing permeable clothing (e.g., standard cotton or synthetic work clothes), follow recommendations for monitoring requirements and suggested work/rest schedules in the current American Conference of Governmental Industrial Hygienists' (ACGIH) Threshold Limit Values for Heat Stress [11]. If the actual clothing worn differs from the ACGIH standard ensemble in insulation value and/or wind and vapor permeability, change the monitoring requirements and work/rest schedules accordingly [12].

Suggested Frequency of Physiological Monitoring for Fit and Acclimatized Workers*

ADJUSTED TEMPERATURE ^b	NORMAL WORK ENSEMBLE ^c	IMPERMEABLE ENSEMBLE
90°F (32.2°C) or above	After each 45 minutes of work	After each 15 minutes of work
87.5° - 90°F (30.8° - 32.2°C)	After each 60 minutes of work	After each 30 minutes of work
82.5° - 87.5°F (28.1° - 30.8°C)	After each 90 minutes of work	After each 60 minutes of work
77.5° - 82.5°F (25.3° - 28.1°C)	After each 120 minutes of work	After each 90 minutes of work
72.5° - 77.5°F (22.5° - 25.3°C)	After each 150 minutes of work	After each 120 minutes of work

Source: Reference [13].

*For work levels of 250 kilocalories/hour.

^bCalculate the adjusted air temperature ($t_{a\text{adj}}$) by using this equation: $t_{a\text{adj}} \text{ } ^\circ\text{F} = t_a \text{ } ^\circ\text{F} + (13 \times \% \text{ sunshine})$. Measure air temperature (t_a) with a standard mercury-in-glass thermometer, with the bulb shielded from radiant heat. Estimate percent sunshine by judging what percent time the sun is not covered by clouds that are thick enough to produce a shadow. (100 percent sunshine = no cloud cover and a sharp, distinct shadow; 0 percent sunshine = no shadows.)

^cA normal work ensemble consists of cotton coveralls or other cotton clothing with long sleeves and pants.

Signs and Symptoms of Heat Stress^a

- Heat rash may result from continuous exposure to heat or humid air.
- Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:
 - muscle spasms
 - pain in the hands, feet, and abdomen
- Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:
 - pale, cool, moist skin
 - heavy sweating
 - dizziness
 - nausea
 - fainting
- Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be obtained. Signs and symptoms are:
 - red, hot, usually dry skin
 - lack of or reduced perspiration
 - nausea
 - dizziness and confusion
 - strong, rapid pulse
 - coma

^aSource: Reference [16].

responses, and some of the precautionary and training measures that need to be taken to avoid PPE-induced injury.

The physiological factors may affect worker ability to function using PPE include:

- Physical condition.
- Level of acclimatization.
- Age.
- Gender.
- • Weight.

Physical Condition

Physical fitness is a major factor influencing a person's ability to perform work under heat stress. The more fit someone is, the more work they can safely perform. At a given level of work, a fit person, relative to an unfit person, will have [5,8,15,16]:

- Less physiological strain.
- A lower heart rate.
- A lower body temperature, which indicates less retained body heat (a rise in internal temperature precipitates heat injury).
- A more efficient sweating mechanism.
- Slightly lower oxygen consumption.
- Slightly lower carbon dioxide production.

Level of Acclimatization

The degree to which a worker's body has physiologically adjusted or acclimatized to working under hot conditions affects his or her ability to do work. Acclimatized individuals generally have lower heart rates and body temperatures than unacclimatized individuals [17], and sweat sooner and more profusely. This enables them to maintain lower skin and body temperatures at a given level of environmental heat and work loads than unacclimatized workers [18]. Sweat composition also becomes more dilute with acclimatization, which reduces salt loss [8].

- For workers wearing semipermeable or impermeable¹ encapsulating ensembles, the ACGIH standard cannot be used. For these situations, workers should be monitored when the temperature in the work area is above 70°F (21°C) [6].

To monitor the worker, measure:

- **Heart rate.** Count the radial pulse during a 30-second period as early as possible in the rest period.

If the heart rate exceeds 110 beats per minute at the beginning of the rest period, shorten the next work cycle by one-third and keep the rest period the same.

If the heart rate still exceeds 110 beats per minute at the next rest period, shorten the following work cycle by one-third [12].

- **Oral temperature.** Use a clinical thermometer (3 minutes under the tongue) or similar device to measure the oral temperature at the end of the work period (before drinking).

If oral temperature exceeds 99.6°F (37.6°C), shorten the next work cycle by one-third without changing the rest period.

If oral temperature still exceeds 99.6°F (37.6°C) at the beginning of the next rest period, shorten the following work cycle by one-third [12].

Do not permit a worker to wear a semipermeable or impermeable garment when his/her oral temperature exceeds 100.6°F (38.1°C) [12].

- **Body water loss,** if possible. Measure weight on a scale accurate to ± 0.25 lb at the beginning and end of each work day to see if enough fluids are being taken to prevent dehydration. Weights should be taken while the employee wears similar clothing or, ideally, is nude. *The body water loss should not exceed 1.5 percent total body weight loss in a work day* [12].

Initially, the frequency of physiological monitoring depends on the air temperature adjusted for solar radiation and the level of physical work (see Table 8-10). The length of the work cycle will be governed by the frequency of the required physiological monitoring.

Prevention

Proper training and preventive measures will help avert serious illness and loss of work productivity. Preventing heat stress is particularly important because once someone suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat injuries. To avoid heat stress, management should take the following steps:

- **Adjust work schedules:**

Modify work/rest schedules according to monitoring requirements.

Mandate work slowdowns as needed.

Rotate personnel: alternate job functions to minimize overstress or overexertion at one task.

Add additional personnel to work teams.

Perform work during cooler hours of the day if possible or at night if adequate lighting can be provided.

- Provide shelter (air-conditioned, if possible) or shaded areas to protect personnel during rest periods.
- Maintain workers' body fluids at normal levels. This is necessary to ensure that the cardiovascular system functions adequately. Daily fluid intake must approximately equal the amount of water lost in sweat, i.e., 8 fluid ounces (0.23 liters) of water must be ingested for approximately every 8 ounces (0.23 kg) of weight lost. The normal thirst mechanism is not sensitive enough to ensure that enough water will be drunk to replace lost sweat [14]. When heavy sweating occurs, encourage the worker to drink more. The following strategies may be useful:

Maintain water temperature at 50° to 60°F (10° to 15.6°C).

Provide small disposable cups that hold about 4 ounces (0.1 liter).

Have workers drink 16 ounces (0.5 liters) of fluid (preferably water or dilute drinks) before beginning work.

Urge workers to drink a cup or two every 15 to 20 minutes, or at each monitoring break. A total of 1 to 1.6 gallons (4 to 6 liters) of fluid per day are recommended, but more may be necessary to maintain body weight.

Weigh workers before and after work to determine if fluid replacement is adequate.

- Encourage workers to maintain an optimal level of physical fitness:

Where indicated, acclimatize workers to site work conditions: temperature, protective clothing, and workload (see *Level of Acclimatization* at the end of this chapter).

Urge workers to maintain normal weight levels.

- Provide cooling devices to aid natural body heat exchange during prolonged work or severe heat exposure. Cooling devices include:

Field showers or hose-down areas to reduce body temperature and/or to cool off protective clothing.

Cooling jackets, vests, or suits (see Table 8-5 for details).

- Train workers to recognize and treat heat stress. As part of training, identify the signs and symptoms of heat stress (see Table 8-11).

Other Factors

PPE decreases worker performance as compared to an unequipped individual. The magnitude of this effect varies considerably, depending on both the individual and the PPE ensemble used. This section discusses the demonstrated physiological responses to PPE, the individual human characteristics that play a factor in these

¹Although no protective ensemble is "completely" impermeable, for practical purposes an outfit may be considered impermeable when calculating heat stress risk.

Acclimatization can occur after just a few days of exposure to a hot environment [15,16]. NIOSH recommends a progressive 6-day acclimatization period for the unacclimatized worker before allowing him/her to do full work on a hot job [16]. Under this regimen, the first day of work on site is begun using only 50 percent of the anticipated workload and exposure time, and 10 percent is added each day through day 6 [16]. With fit or trained individuals, the acclimatization period may be shortened 2 or 3 days. However, workers can lose acclimatization in a matter of days, and work regimens should be adjusted to account for this.

When enclosed in an impermeable suit, fit acclimatized individuals sweat more profusely than unfit or unacclimatized individuals and may therefore actually face a greater danger of heat exhaustion due to rapid dehydration. This can be prevented by consuming adequate quantities of water. See previous section on *Prevention* for additional information.

Age

Generally, maximum work capacity declines with increasing age, but this is not always the case. Active, well-conditioned seniors often have performance capabilities equal to or greater than young sedentary individuals. However, there is some evidence, indicated by lower sweat rates and higher body core temperatures, that older individuals are less effective in compensating for a given level of environmental heat and work loads [19]. At moderate thermal loads, however, the physiological responses of "young" and "old" are similar and performance is not affected [19].

Age should not be the sole criterion for judging whether or not an individual should be subjected to moderate heat stress. Fitness level is a more important factor.

Gender

The literature indicates that females tolerate heat stress at least as well as their male counterparts [20]. Generally, a female's work capacity averages 10 to 30 percent less than that of a male [8]. The primary reasons for this are the greater oxygen-carrying capacity and the stronger heart in the male [15]. However, a similar situation exists as with aging: not all males have greater work capacities than all females.

Weight

The ability of a body to dissipate heat depends on the ratio of its surface area to its mass (surface area/weight). Heat loss (dissipation) is a function of surface area and heat production is dependent on mass. Therefore, heat balance is described by the ratio of the two.

Since overweight individuals (those with a low ratio) produce more heat per unit of surface area than thin individuals (those with a high ratio), overweight individuals should be given special consideration in heat stress situations. However, when wearing impermeable clothing, the weight of an individual is not a critical factor in determining the ability to dissipate excess heat.

ATTACHMENT 2

EXPOSURE/INJURY INCIDENT REPORT



EMPLOYEE ACCIDENT/INJURY INCIDENT REPORT

(A separate report is to be completed for each incident and submitted immediately to the Director, Corporate Health and Safety for consideration.)

DATE: _____

1. Employee's Name: _____ 2. Employee No. _____

3. Sex: M _____ F _____ 4. Age: _____ 5. Marital Status: _____

6. Office/Department: _____ 7. WO No: _____

8. Title: _____

9. Incident:

a. Type - Possible Exposure _____ Exposure _____

Physical Injury _____

b. Location _____

c. Date of Incident _____ d. Time of Incident _____

e. Date of Reporting Incident _____

f. Date of Initial Diagnosis _____

g. Person to Whom Incident was Reported _____

h. Weather Condition During Incident - Temperature _____

Wind Speed & Direction _____ Humidity _____

Cloud Cover _____ Clear _____ Precipitation _____

i. Name of Materials Potentially Encountered:

Chemical (liquid, solid, gas, vapor, fume, mist): _____

Radiological: _____

Other: _____

- j. Has the client been notified of the incident? Yes _____ No _____
If "yes", attach documentation.

10. Nature of the Exposure/Injury:

- a. State the nature of the exposure/injury in detail, list the parts of the body affected and how it occurred. (Attach extra sheets if needed.)

- b. Did you receive medical care? Yes _____ No _____

- c. If so, When? _____

- d. Where? On-Site _____ Off-Site _____

- e. By Whom? Name of Paramedic _____

Name of Physician _____

Other _____

- f. If "Off-Site", name facility (hospital, clinic, etc); obtain Copy of medical report. _____

g. Length of stay at the facility _____

- h. Was the Director, Corporate Health and Safety contacted? _____

Yes _____ No _____. If Yes, When? _____

- i. Was the WESTON Medical Toxicological System activated?

Yes _____ No _____. If so, who was the contact _____

- j. Did the exposure/injury result in death? Yes _____ No _____

If so, give the date _____

- k. Did the exposure/injury result in permanent disability?

Yes _____ No _____. If so, explain: _____

1. Has the employee returned to work? Yes _____ No _____

If so, give date _____

m. List the names of other persons affected during this incident:

n. List the names of persons who witnessed the exposure/injury incident:

11. Possible cause of the exposure/injury:

a. What was the name and title of the field team leader or immediate supervisor at the site of the incident?

b. Was the operation being conducted under an established Safety Plan? Yes _____ No _____. If yes, attach a copy. If no, explain:

c. Was protective equipment and clothing used by the employee Yes _____ No _____. If yes, list items: _____

d. Did any limitations in safety equipment or protective clothing contribute or affect exposure, or contribute to injury? If so, explain: _____

e. What was the employee doing when the exposure/injury occurred? (Describe briefly as "Site Reconnaissance", "Site Categorization", "Sampling", etc.)

f. Where exactly on-site or off-site did the exposure/injury occur?

g. How did the exposure/injury occur? (Describe fully what factors led up to and/or contributed to the incident.)

12. Attach any other relevant data and information regarding this incident.

13. Name of person(s) initiating report, job title, phone number:

(Employee Signature)

(Date)

(Field Team Leader or Supervisor's Signature)

(Date)



Medical Consultants Comments: _____

Physician's Signature _____

Date _____

(For Director, Corporate Health and Safety use only)

Reviewed and Comments: _____

Action Required: Yes _____ No _____. If so, what action: _____

Follow-up action carried out: _____

Date _____

Explain Corrective Actions to be Taken to Prevent Reoccurrences:

(Supervisor's Signature) PD, PM or Dept. Mgr.

(Date)

DSC/RSO Signature

(Date)

(Employee's Signature)

(Date)

COPIES

Original to Corporate Health and Safety
First copy to Human Resources
Second copy for Regional or Divisional Safety Files

ATTACHMENT 3

WESTON Personnel Certification
Summary

	Name	Medical Current	FIT Test Current	Certification Level
1.	Susanne Kraemer, Site MGR	(x)	(x)	(C-S)
2.	Jeff Bannon, SHSC	(x)	(x)	(B-S)
3.		()	()	()
4.		()	()	()
5.		()	()	()
6.		()	()	()
7.		()	()	()
8.		()	()	()
9.		()	()	()
10.		()	()	()

Site Safety Coordinator: Jeff Bannon

Appendix E

APPENDIX E

SAMPLING AND ANALYSIS PLAN



SAMPLING AND ANALYSIS PLAN

FOR

**ITT FACILITY
BURBANK, CALIFORNIA**

2 November 1989

W.O. No. 2588-08-01

Prepared by

Roy F. Weston, Inc.
1350 Treat Blvd., Suite 200
Walnut Creek, California 94596

SAMPLING AND ANALYSIS PLAN

TABLE OF CONTENTS

<u>Section</u>	<u>Description</u>	<u>Page</u>
1.0	INTRODUCTION	1
	1.1 Scope of Work	1
	1.2 Site History	1
	1.3 Objectives	4
2.0	FIELD METHODS	5
	2.1 Soil-Gas Surveys	5
	2.2 Ambient Air Monitoring	7
	2.3 Geophysical Surveys	8
	2.4 Soil Boring Installation	12
	2.5 Hand Augering	13
	2.6 Vertical and Horizontal Surveys	14
	2.7 Sample Custody	14
3.0	ANALYTICAL METHODS	18
	3.1 Major Chemicals of Concern	18

LIST OF FIGURES

1-1	Area Location Map for ITT	2
1-2	Site Map, ITT Facility	3

LIST OF TABLES

3-1	Chemicals of Concern and Analytical Methods	19
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1.0 INTRODUCTION

1.1 SCOPE OF WORK

This Sampling and Analysis Plan has been prepared as part of the technical report on studies performed at the ITT Aerospace Controls Division Site in the San Fernando Valley. The site is located at 1200 South Flower Street, bounded by Alameda Avenue, Flower Street, Allen Avenue, and the Southern Pacific Railroad Mainline in the cities of Burbank and Glendale, California (Figure 1-1). This plan addresses proposed sampling in the vicinity of Buildings 2 and 3 (Figure 1-2), where a program of surface and subsurface sampling activities was conducted by A.L. Burke Engineers, Inc. (ALB).

Following this introduction, Section 2 presents a summary of field sampling techniques, including actual methodologies and QA/QC procedures. Section 3 presents the chemicals of concern at the site and associated laboratory methods.

1.2 SITE HISTORY

The ITT site consists of 11.7 acres of land. At the present time, two divisions of ITT are at the site: ITT Aerospace and ITT General Controls. ITT General Controls has completed relocation from the site as of September 1989.

Prior to industrial use, the land was residential property (ITT, personal communication). General Controls purchased the property in the early 1930's, and a variety of processes have been performed at the facility since that time.

ITT purchased General Controls in 1963. In 1986, ITT initiated a tank removal program in order to demolish existing structures and prepare for construction of new facilities. In 1987, ITT Aerospace Controls assumed responsibilities for the areas formerly occupied by ITT General Controls, and proposed to build a new building on the site of Buildings 1, 2, and 3. Buildings 10 and 12 were demolished in 1988, while Buildings 8, 9, 9A, and 13 were demolished in 1989. Approximately five USTs were removed with the approval of the City of Burbank and the City of Glendale Fire Departments prior to demolition of these buildings.

As stated above, the present investigation focuses on the area of Buildings 1, 2, and 3. Building 1 was used for administrative purposes. ITT General Controls used Building 2 as a machine shop. Parts were machined in Building 2, but not assembled there. Items of production included primarily thermostats, residential and commercial gas valves, and oil field steam valves. Different machining processes were used over the years. Most of these operations

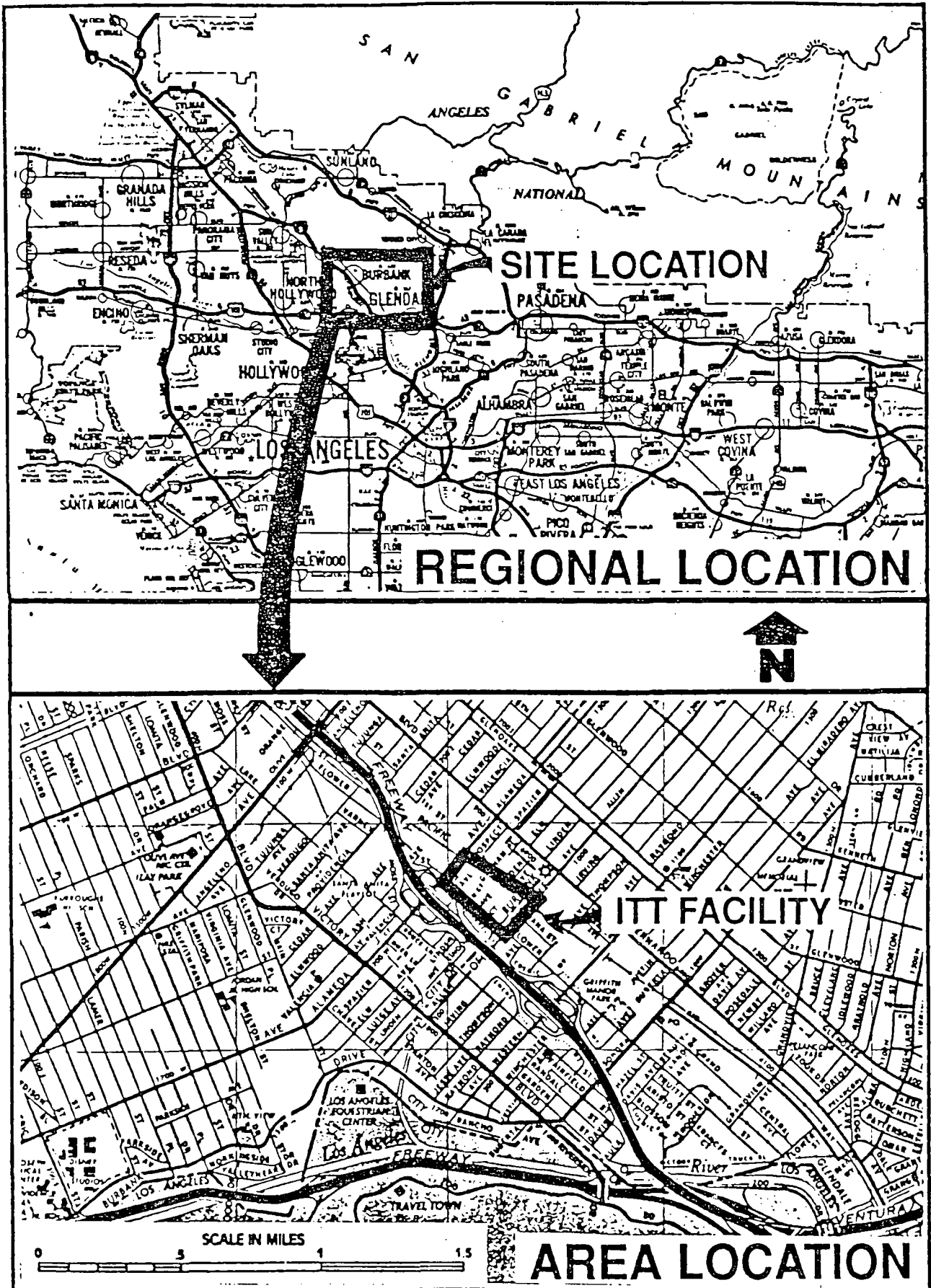


FIGURE 1-1 AREA LOCATION MAP FOR ITT FACILITY

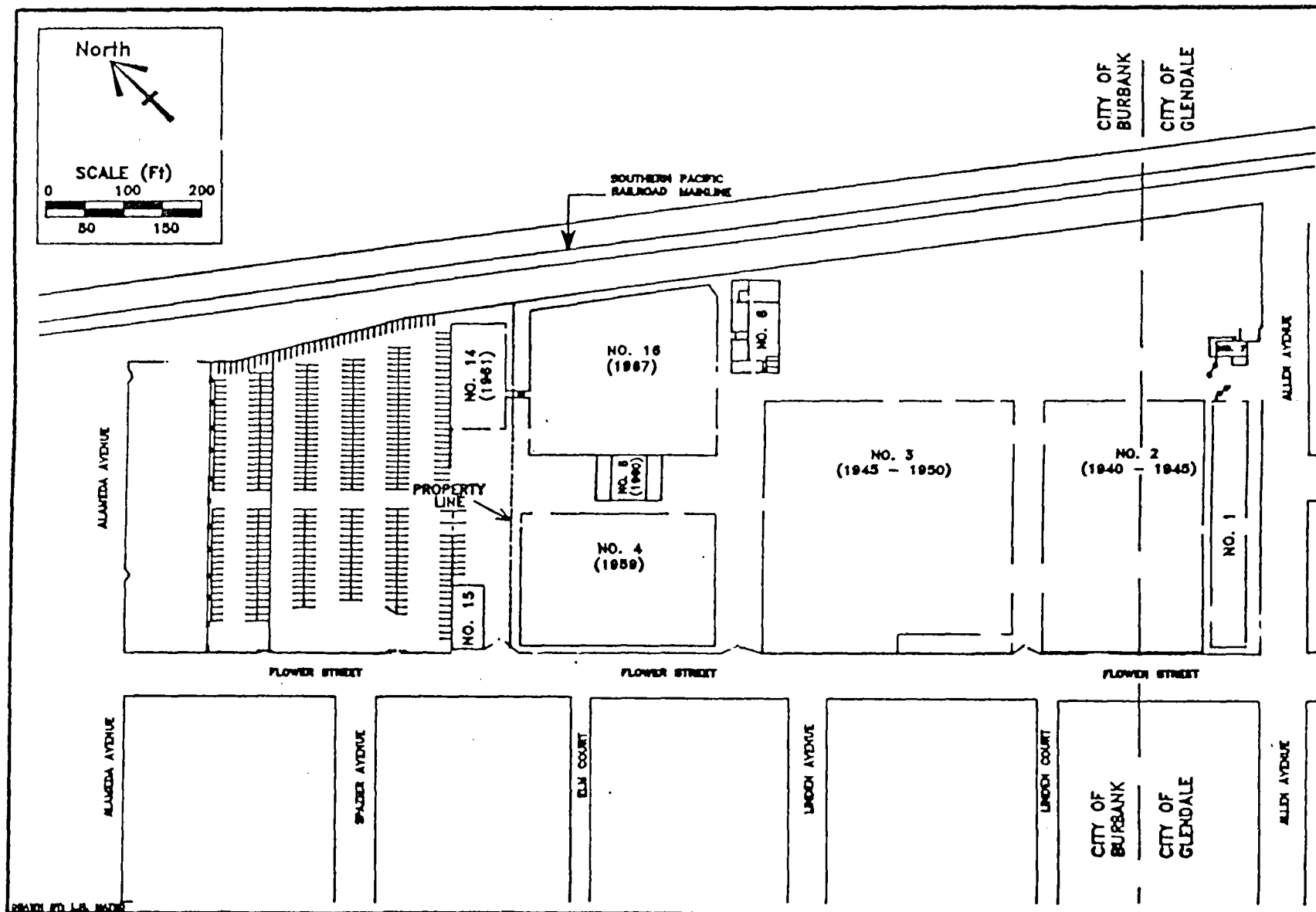


FIGURE 1-2 SITE MAP - ITT AEROSPACE CONTROLS FACILITY, BURBANK, CA.

were discontinued in 1986, although the parts washer in Building 2 was used until 1988. Processes over the years have used trichloroethene (TCE), perchloroethylene, 1,1,1-trichloroethane (1,1,1-TCA), diesel fuel, butane, kerosene, cutting oil, motor oil, sulfuric acid, nitric acid, and muriatic acid, among others.

A well is located in Building 2, although it is no longer in use. Based on field measurements, the well appears to be silted in to a depth of about 31 feet. No chemical analyses are available. It was used as a water supply for the parts washing operations that were performed outside in the area of Building 9A.

While ITT General Controls used Building 3 for parts assembly and storage in the past, operations are no longer performed there. Different processes have been performed in Building 3 since the early 1950's, and include parts assembly, heat treating, rock tumbling, impregnating, degreasing, metal finishing, plating, wastewater treatment, welding, and painting. Over the years, processes have used trichloroethene (TCE), perchloroethylene, isopropyl alcohol, sodium cyanide, zinc cyanide, barium carbonate, zinc chloride, chromic acid, nitric acid, sulfuric acid, and muriatic acid, among others.

1.3 OBJECTIVES

The overall objectives of this current study were 1) to evaluate environmental studies performed to date at the ITT site and, 2) to develop an appropriate action plan to complete the characterization of the site in preparation for construction on the site. To achieve these objectives, the following consultants reports and information were reviewed:

- Data compiled by A.L. Burke Engineers, 1988 and 1989.
- Environmental Engineering Consultants, Evaluation of the Data obtained by A.L. Burke Engineers, Inc., for Soil Conditions at Bldg. 2 and Bldg. 3, ITT General Controls Division, April 1989.
- Harding Lawson Associates, Site Assessment, Underground Tank Leakage, Aerospace Facility, June 1986.
- Leroy Crandall and Associates, Report of Preliminary Foundation Investigation, Proposed Administration/Manufacturing Building, Flower Street between Alameda Street and Allen Avenue, May 1988.

2.0 FIELD METHODS

The following subsections present step-by-step procedures for field techniques commonly employed during site investigations. Included with the step-by-step procedures are quality assurance/quality control measures (QA/QC) employed as part of each field technique. The overall quality assurance objective for field activities and laboratory analyses is to produce data of known and sufficient quality to support evaluation of environmental effects. Standard procedures are used so that known and sufficient acceptable levels of accuracy, precision, completeness, representativeness, and comparability are achieved for all data.

2.1 SOIL-GAS SURVEYS

Soil-gas sampling is an investigative technique in which vapors are withdrawn through probes directly from the pore space of subsurface soils and analyzed in a mobile laboratory for the presence of vapor-phase compounds. Sources for vapor-phase compounds in soil-gas include direct diffusion from spills, buried waste, or leaking underground tanks and lines; and diffusion of vapors from compounds present in the groundwater.

The soil-gas program is designed to provide initial screening for vapor-phase compounds in the near-surface soils that may be related to site practices. Primary samples are usually collected on 25- to 100-foot grid centers depending on the size and nature of each individual site. The samples are analyzed for various site-specific target compounds in a mobile laboratory equipped with a GC/MS unit. Secondary samples are then collected, if necessary, on smaller grid spacings in areas where significant concentrations of target or other compounds are detected during the primary sampling. An attempt is made to surround areas of compound detection with sampling locations where compounds are not detected. In this way, "hot spots" or areas with elevated target compound concentrations in the soil vapor can be defined.

Soil-gas samples are collected by drawing soil vapors through a subsurface teflon probe and collecting the vapors in a glass sampling bulb. The probe consists of a 3- to 5-foot length of open-ended, copper tubing lined with Teflon tubing. The probe is inserted into a small-diameter probe hole that is manually advanced into the ground with a slam bar. Generally, the upper root zone soils are removed with a spade prior to advancing the probe hole. Under some field conditions, an initial, larger-diameter pilot hole may be advanced through the upper 1 to 2 feet of soils with a hand-held power auger. Where asphalt cover is present, a pilot hole is advanced using a hand-held, rotary-hammer power drill.

The annular space between the probe hole and the probe is sealed at the surface with a rubber stopper coated with bentonite paste. The annulus between the copper and Teflon tubing is sealed at the surface with Teflon tape. These seals prevent leakage of atmospheric vapors into the annular space of the soil-gas probe and probe hole.

Soil vapor is then purged from the probe and through an in-line, 250-mL glass sampling bulb equipped with Teflon stopcocks and septum. Purging is performed with an electric vacuum pump equipped with a flow regulator. The soil vapor is purged at a rate of 100 mL per minute, generally for 2 to 4 minutes, depending on field tests and conditions. A revised method may be used in tight soils, wherein probes are capped after installation and allowed to equilibrate overnight. Soil-gas samples are collected the following day, with purge volumes of approximately 200 mL.

Samples are analyzed in a mobile laboratory equipped with a GC/MS unit. A sample volume of 0.1 to 5 mL (depending on concentration - usually 1 mL) is withdrawn through the septum of the gas sampling bulb into a gas-tight syringe, then injected into a Hewlett-Packard Model 5890 gas chromatograph.

The GC unit is equipped with a 2-mm ID by 4-foot glass column filled with 60/80 mesh Carbopak coated with 1 percent SP1000 stationary phase. Helium is used as the carrier gas at a flow of about 25 mL/minute, and the oven temperature is programmed from 70°C to 230°C at a rate of 15°C/minute. The column effluent is delivered to a Hewlett-Packard Model 5970 mass spectrometer equipped with an HP Model 1000 computer. Selected ions are used to monitor the target compounds, and quantitation ions used are per EPA Method 8240 protocol (excluding the ketones).

Additional compounds included in EPA Method 8240 are also monitored as necessary, and common freons, alcohols, ketones, hydrocarbons, and other required compounds can be included as necessary. Quantification is evaluated by the use of external standards. A three-point initial calibration is run, and beginning and end-of-day calibration check standards are used to verify response factor stability.

Analytical blanks, usually ambient air, are run after each standard and after any sample where the possibility of "carry-over" or cross-contamination is considered to be high.

Formal quantitative reports, including chromatograms, are produced immediately upon completion of the analytical procedure, usually within 15 to 20 minutes after sample receipt.

Bulbs that contain water are analyzed as above, with the following modifications. A sample aliquot of water is placed in a sealed vial (glass with Teflon-backed septum) with several grams of sodium chloride, heated to a set temperature and shaken for several minutes; head-space vapor is then extracted for analysis.

Soil-gas QA/QC procedures are as follows:

- Daily calibration of the GC/MS unit with VOC standards of known content and concentration.
- Baking of sample bulbs and syringes, and purging with nitrogen gas prior to sample collection.
- Daily ambient air sample collected in the mobile laboratory with 1-mL syringe.
- Daily ambient air sample collected in field with 1-mL syringe.
- Daily field duplicate sample collected in field.
- Labeling of sample bulbs to track sampling order (i.e., if bulb sample contains similar compounds as previous sample, additional samples are collected using different bulbs for QC purposes).
- Field blanks (N_2 -purged bulbs, unopened) analyzed periodically (particularly after a bulb contains a high concentration of volatile compounds).
- Washing of probes and heating after each use.
- Recording of pertinent field data on sampling log sheets for each sample.

2.2 AMBIENT AIR MONITORING

Ambient air quality is monitored during field activities for both health and safety and technical purposes. Many different parameters can be monitored at different stages of the field investigation as part of the health and safety program. These parameters include organic vapors, combustible gases, oxygen content, hydrogen cyanide, benzene, and beta and gamma radiation.

Real-time monitoring of the parameters enables field personnel to choose the appropriate levels of health and safety protection necessary during each field activity. Screening of soils for organic vapors also provides a basis for certain technical field decisions, including:

- Choosing soil samples from each boring for chemical analyses.
- Determining whether containerization of soil cuttings is needed.

Ambient air quality also is monitored during the soil-gas program. Daily ambient blanks are collected at each soil-gas site for quality assurance purposes by drawing ambient air into a 1-mL syringe and analyzing the sample for VOCs in a mobile laboratory. While primarily for quality assurance purposes, these data may also provide information for a qualitative risk assessment related to ambient air quality.

2.3 GEOPHYSICAL SURVEYS

This section documents the field data acquisition procedures and analyses for geophysical surveys. Geophysical techniques commonly employed at investigation sites include magnetics (MAG), electro-magnetics (EM), and ground penetrating radar (GPR).

A survey grid system is established by WESTON personnel for surface reference/ground control at each site prior to the commencement of the geophysical activities.

Magnetic measurements are obtained using an EDA Instruments Inc., OMNI IV "tie-line" magnetometer. The unit includes a double sensor, collapsible aluminum staff, signal cable, chest harness, and a rechargeable lead/acid battery cartridge. A detailed description of the magnetometer's operating principles can be found in the EDA Instruments Inc. operations manual.

The magnetic method detects variations in magnetic susceptibility within the subsurface environment. Magnetic susceptibility is a physical property of matter that describes the ease of its magnetization. For example, while most sedimentary rocks have magnetic susceptibilities ranging between 10^{-6} and 10^{-5} centimeter-gram-second (cgs), iron alloys have susceptibilities ranging from to 1 to 10^{+6} cgs (Breiner, 1973). When the earth's magnetic field encounters a material having a high magnetic susceptibility (e.g., ferrous metal), magnetization is induced. The material is magnetized, and the resulting magnetic field is the product of its volume magnetic susceptibility (in cgs units) and the earth's field

intensity (in gauss units). A magnetometer measures the vector sum of the earth's magnetic field and the induced magnetic field. Consequently, local variations in the earth's magnetic field generated by buried ferrous materials can be measured.

The magnetometer is programmed for data acquisition prior to the first survey. The magnetometer's internal clock is synchronized to local time, and the magnetometer is tuned to the regional magnetic field to achieve the optimum signal strength.

The magnetic surveys are conducted along pre-established grid systems at each site. Magnetic measurements are collected on an initial grid spacing of approximately 25-feet. "Infill" magnetic measurements are performed following initial inspection of the magnetic data to more accurately define the location of magnetic anomalies.

The sensors are set at a fixed height of 2.5 and 3.0 meters above ground surface throughout the magnetic surveys. Data are recorded for the total magnetic field and magnetic gradient by entering the grid coordinate location and the associated magnetic field measurements in the magnetometer's digital memory. Locations of cultural features (e.g., metallic fences, power lines, concrete blocks, scrap metal, etc.) and inaccessible areas are recorded in the field notebook during each of the surveys.

Several procedures are followed to ensure data integrity. For example, base station readings are obtained hourly throughout each of the surveys to monitor daily (diurnal) variation of the earth's magnetic field. The base station is chosen in an area thought to be free of known buried waste material and cultural interferences. Four sequential readings are taken at the base station three times per day to identify variations produced by the instrument's circuitry or by magnetic storm activity. A four-directional swing sensor test is conducted at the base station to identify whether any significant directional variation existed within the magnetic field.

The magnetic values obtained at the first and last stations along each traverse are manually recorded in the field notebook during the survey. Following each day's survey the data are electronically transferred from the magnetometer's digital memory to a Zenith portable computer. These output values are then compared to the information recorded in the field notebook as a quality assurance (QA) measure.

The Geonics Limited EM31-D Terrain Conductivity meter (EM31) is used to obtain conductivity measurements of the shallow subsurface. Conductivity measurements are generally collected on 20- to 25-foot centers.

The EM31 system consists of a self-contained dipole transmitter (primary field source) and receiver (sensor), phase-sensing circuits, an amplifier, and an OMNIDATA Polycorder Electronic Notebook (Polycorder). The EM31 is powered by eight alkaline "C" cells and operates at a frequency of 9.8 kHz. The Polycorder is used to record and store the EM31 signal of the quadrature and in-phase component measurements for rapid and accurate data transfer to a computer or printer.

The electromagnetic method can detect lateral and vertical variations of electrical conductivity in the subsurface. These variations may result from buried metal objects or from groundwater plumes with elevated total dissolved solids concentrations.

Daily calibration checks are conducted prior to each day's survey at the same base stations used for the MAG surveys. These daily QA/QC checks ensure proper meter calibration, instrument sensitivity, and instrument phasing. In addition, battery checks are performed for both the EM31 and Polycorder. All of these QA/QC readings are recorded on the OMNI Polycorder. At least one additional base station calibration check is recorded during each day of the EM31 survey to ensure that the instrument is maintaining calibration.

Measurements taken at the beginning and end of each traverse are recorded in the field notebook to ensure that the data are being recorded accurately. The field notebook also is used to document cultural features that may influence any conductivity measurements. Noted cultural features include scrap metal, power lines, antenna lines, concrete blocks (possibly containing rebar), visible drums, and fences.

Following each day's survey, the data are electronically transferred from the Polycorder's memory to a field computer using the DAT 31 Version 1.07 software package (Geonics, Ltd., 1987) and permanently stored on a 3.5-inch floppy disk. These records are then compared to the data recorded in the field notebook for quality assurance purposes.

GPR surveys are conducted with profiles spaced at approximately 25-foot intervals. One traverse is used as a quality control line to ensure that variations between traverses were due to changing soil conditions (i.e., increases in moisture content) rather than aberrations in the system electronics. Wherever access is possible GPR traverses are performed in both the north-south and east-west directions.

A Geophysical Survey System, Inc. (GSSI) Model SIR System 8 GPR system coupled to either a 120-MHz or 300-MHz antenna is used for

GPR surveys. The System 8 unit consists of a Model 4800 radar control unit, Model SR-8004H graphic recorder, Model SP-100 micro-computer, Model P731 calibration unit, and a transducer cable. A 12-volt battery source from the field vehicle is used to power the radar system.

The GPR system is a surface interface radar (SIR) that transmits an electromagnetic pulse into the subsurface. The electromagnetic pulse travels through the subsurface until it encounters a soil interface or emplaced object with a contrasting dielectric constant. This contrast in electrical characteristic causes a portion of the transmitted pulse to be reflected back to the surface. The reflected energy is received by the antenna and is then transmitted to the microprocessor in the control unit. The reflected electromagnetic pulse is processed in the control unit and transmitted to an oscilloscope, a graphic recorder, or a tape deck. The graphic recorder produces a hard copy subsurface profile that can be analyzed in the field or office. A more detailed discussion on the GPR method is contained in the GSSI SIR System 8 operations manual.

The GPR system is calibrated relative to on-site soil and moisture properties prior to conducting each survey. The objective of the calibration is to establish a two-way travel time (t_2) of the radar wave which corresponds to the profile or record length. The GPR equipment is calibrated over culverts of known burial depths prior to initiating the survey at each site. A GPR traverse with a preset record length of 100 nanoseconds (ns) is run over the ground surface, the position of the top of the culvert recorded, and the "velocity" (v) of the radar wave in the materials calculated using equation 1:

$$v = \frac{t_2}{2X} \quad (1)$$

where:

v = Velocity of propagation in subsurface material.

X = Depth (feet) to culvert.

t_2 = Pulse two-way travel time (nanoseconds).

This equation yields a "velocity" in nanoseconds/foot (ns/ft). The minimum desired depth of penetration is estimated, and equation 2 produces a minimum required record length:

$$(v)(2D) = RL \quad (2)$$

where:

v = Velocity from equation 1.
D = Desired depth of penetration (feet).
RL = Record length (nanoseconds).

2.4 SOIL BORING INSTALLATION

Shallow soil borings are drilled to assess the lateral and vertical extent of chemicals of concern in soils at the site. Shallow borings can be located based upon soil-gas survey results and are generally drilled using the hollow-stem auger technique. Drilling rigs are inspected upon site arrival for any significant fluid leaks. The rig and all drilling tools are steam cleaned prior to the start of drilling at each soil boring location to minimize the possibility of cross-contamination between sampling locations.

Soil samples are collected via split-spoon sampling. With split-spoon sampling, two lengthwise halves of a hollow, 2-inch diameter, 18-inch long steel tube are fitted together and are fastened to the slidehammer. The split-spoon sampler is driven by Standard Penetration Test (SPT) methods (i.e., a 140-lb hammer dropping 30 inches). The sampler is driven 18 inches, and the number of hammer blows per 6 inches of advance recorded.

California modified split-spoon samplers are used, which can accommodate 2-inch OD brass sample tubes. All brass tubes are decontaminated before use as described later in this subsection. Four sections of 4-inch long brass tubing are fitted inside each split-spoon flush with the inside walls of the spoon. After being driven 1.5 feet, the split-spoons are retrieved and opened. The sections of tubing are separated using a clean knife and screened for organic vapors with an HNu or OVA. Samples are chosen for chemical analyses based upon soil condition as observed at the ends of the tube, HNu and/or OVA readings, or stratigraphy. Generally, the two lowermost brass tubes from a split-spoon sample are submitted to the laboratory; one for VOC analyses, and the other for additional analyses. These tubes are usually more representative samples since the soils in the upper tubes may be cave-in from shallower depths in the boring. The tubes are sealed for laboratory shipment by covering the ends with Teflon sheeting, placing caps over the Teflon, and taping the caps with electrical tape. The tubes are labeled and placed on ice in a clean cooler. The soil is extruded from the remaining brass tubes onto a clean surface and described by a WESTON geologist for lithology following the Unified Soil Classification System (USCS) and in accordance with ASTM D-2487 and ASTM D-2488. Descriptive logs are recorded for all soil borings. Also, where possible, water levels are measured in the borehole and recorded after the level stabilizes.

All sampling equipment is decontaminated between sampling points using the following procedure:

- Place dirty equipment, (e.g., bailers, pumps, buckets, etc.) on a plastic ground sheet at the head of the "decon line."
- Rinse equipment in a tub of potable water to remove surface dirt and mud, if necessary.
- Scrub equipment in a tub of potable water to remove surface dirt and mud, if necessary.
- Scrub equipment with a bristle brush in a basin filled with laboratory-grade detergent and potable water.
- Rinse off soap in a tub of potable water.
- Rinse with deionized water.
- Allow equipment to dry before use.
- Do not allow sampling equipment used to collect samples for organic analyses to come in contact with any type of plastic after decontamination.

All completed soil borings are tremie-grouted to the surface with a slurry consisting of approximately 7 to 8 gallons of water per 94-lb bag of cement with 5 percent bentonite powder.

All borehole cuttings are removed to an area specified by the client, and the general area of the borehole cleaned following completion. Drill cuttings suspected of being contaminated are containerized in new, 55-gallon drums provided by WESTON.

An HNu photoionization meter is used to monitor the breathing zone during drilling operations and also to screen soil samples for total volatile organics. Soils are suspected to be contaminated if abnormal discoloration or odor is present or if HNu or OVA levels greater than 5 units above background are encountered.

2.5 HAND AUGERING

Surface and near-surface soil samples can be collected by hand augering techniques, provided they are loose enough to be penetrated. Samples are collected at discrete depths with a decontaminated stainless steel bucket auger equipped with a handle and shaft. Upon removal of the bucket auger, the soil sample is

extruded from the auger, placed in appropriately labeled laboratory cleaned sample containers, and placed on ice in a clean cooler.

All hand augering equipment is decontaminated before sampling and between sampling locations. Decontamination procedures are identical to those described for soil boring equipment (see previous Section 2.3).

2.6 VERTICAL AND HORIZONTAL SURVEYS

Vertical and horizontal surveys are conducted by a State of California-licensed surveyor. The vertical survey is conducted to an accuracy of 0.01 foot and referenced to mean sea level (MSL). The horizontal survey is conducted to an accuracy of 1 foot and referenced to the State of California coordinate system or City reference points. The 0, 0 coordinate of the soil-gas and geophysical survey grids are generally surveyed.

2.7 SAMPLE CUSTODY

The purpose of sample custody procedures is to document the history of sample containers and samples (and sample extracts or digestates) from the time of preparation of sample containers through sample collection, shipment, and analysis. An item is considered to be in one's custody if:

- It is in the physical possession of the responsible party,
- It is in the view of the responsible party,
- It is secured by the responsible party to prevent tampering, or
- It is secured by the responsible party in a restricted area.

Chain-of-Custody

All samples will be identified with a label that will be attached directly to the container. Sample labels will be completed using waterproof ink. The labels will contain the following information:

- Sample number.
- Time and date of collection.
- Site.
- Parameters to be analyzed.
- Preservative (if any).
- Sample source/location.
- Sampler's initials.

As each sample is collected it will be placed in a labeled container. Sample numbers will have been determined before the field investigation begins.

Chain-of-Custody Record

To maintain a record of sample collection, transfer between personnel, shipment, and receipt by the laboratory, a chain-of-custody record will be filled out for each sample at each sampling location. Each time the samples are transferred, the signatures of the persons relinquishing and receiving the samples as well as the date and time will be documented.

Transfer of Custody and Shipment

Prior to shipment of samples, the chain-of-custody record will be signed and dated by a member of the WESTON field team who has verified that those samples indicated on the record are indeed being shipped. After packaging has been completed, custody seals, signed and dated by a member of the WESTON field team, will be placed on the cooler.

All samples will be shipped via courier, such as Federal Express, Emery, or other overnight delivery service, to the appropriate laboratory. Upon receipt of the samples at the laboratory, the receiver will complete the transfer by dating and signing the chain-of-custody record.

Laboratory Custody Procedures

When sample containers are provided by WESTON, chain-of-custody documentation will be shipped with the sample containers. These forms should be completed by field personnel with acknowledgment of time and date of transfer and placed in the shipping container in the plastic cover provided.

The following subsections describe laboratory custody procedures associated with sample receipt, storage, preparation, analysis, and general security procedures.

Sample Receipt

- Upon receipt, the sample custodian will inspect sample containers for integrity. The presence of leaking or broken containers will be noted on the chain-of-custody record. The sample custodian will sign (with date and time of receipt) the chain-of-custody record, thus assuming custody of the samples.

- The information on the chain-of-custody record will be compared with that on sample tags and labels to verify sample identity. Any inconsistencies will be resolved with the field sampling representative before sample analysis proceeds.
- Samples will be moved to one of the locked sample storage refrigerators for storage prior to analysis. The storage location will be recorded on the chain-of-custody record.
- The sample custodian will return the original chain-of-custody record to the Laboratory Data Manager and will provide carbon copies; to each laboratory section manager and one to the main sample log kept in the laboratory.
- The sample custodian will alert the appropriate section managers and analysts of any analyses requiring immediate attention because of short holding times.

Sample Storage

Samples will be maintained in storage in one of the locked storage refrigerators prior to sample preparation and analysis. The storage refrigerators are maintained at $4^{\circ} \pm 2^{\circ}\text{C}$. Analysts request samples for analysis from the sample custodian. Both sign the chain-of-custody record to acknowledge transfer of custody to the analyst.

Sample Tracking - Organic Analyses

For samples that require extraction prior to analysis, a sample extraction form is completed during the time of extraction.

When samples are extracted for analysis by gas chromatography, GC/MS, or liquid chromatography, all pertinent data are entered on the sample extraction form and are recorded in a bound laboratory notebook. Data is entered onto the form via computer by the person performing the extraction as the extraction proceeds. A hard copy of the form is printed out and is used as the vehicle for custody transfer to the analyst. Copies are provided to the analysts to inform them that extracts are ready for analysis. The bound laboratory notebook is kept in the laboratory.

Extracts are maintained in refrigerated storage by the sample preparation section until transferred to the analysts.

Sample Tracking - Metals Analyses

Samples are received by the sample preparation section for digestion prior to analysis for metals by atomic absorption/inductivity coupled plasma spectroscopy. When samples are prepared for digestion, the preparation technician fills out a sample digestion record.

All information regarding sample digestion is entered on the sample digestion record as the extraction proceeds and is recorded in a bound laboratory notebook. The digestion record is maintained to acknowledge custody transfer of digestates to the metals analysis section. Upon completion of sample digestion, a carbon copy of the sample digestion record is provided to the metals analysis section to alert them that digestates are ready for analysis.

The bound laboratory notebook is retained by the sample preparation section.

Recordkeeping

Data related to all sample preparation and analysis procedures and observations by laboratory analysts are recorded in bound laboratory notebooks that are issued by the Laboratory Quality Assurance Coordinator. Laboratory notebook pages are signed and dated daily by laboratory analysts. Corrections to notebook entries are made by drawing a single line through the erroneous entry and by writing the correct entry next to the one crossed out. All corrections are initialed and are dated by the analyst.

Building Security

The WESTON laboratory maintains controlled building access at all times. During working hours, all non-WESTON laboratory personnel are required to sign in with the receptionist and are escorted by laboratory personnel while in the building.

The laboratory is locked by a security system between the hours of 5:00 p.m. and 8:00 a.m., Monday through Friday and during non-working hours.

The building is accessed by laboratory employees during non-working hours by using a key and the passcode for the building security system.

Any breach of security during non-working hours sounds a silent alarm to security agency personnel who alert the local law enforcement agency and one of three laboratory personnel via beeper call. Police response to security alarms takes place within 5 minutes, and laboratory personnel are on-site within 20 minutes.

3.0 ANALYTICAL METHODS

3.1 Major Chemicals of Concern

The compounds of concern and associated analytical methods for the ITT Aerospace site are listed in Table 3.1.

TABLE 3-1
CHEMICALS OF CONCERN AND
ANALYTICAL METHODS

<u>Parameter</u>	<u>Analytical Methods</u>		<u>Limits of Detection*</u>	
	<u>Soil</u>	<u>Water</u>	<u>Soil</u> (mg/kg)	<u>Water</u> (ug/L)
Acetone	EPA8240 or 8010/8020	EPA624 or 601/602	0.01	100
2-Butanone (MEK)	EPA8240 or 8010/8020	EPA624 or 601/602	0.01	100
Chlorobenzene	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	1.2
1,1-Dichloroethane	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	0.4
1,1-Dichloroethylene	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	0.7
Methylene Chloride	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	2
Tetrachloroethylene	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	0.2
1,1,2,2- Tetrachloroethane	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	0.2
Trichloroethylene	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	0.6
Toluene	EPA8240 or 8010/8020	EPA624 or 601/602	0.005	1
Antimony	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.010/3.7**	0.2
Arsenic	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.005/5.6	0.005
Barium	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.020/24.0	0.01
Cadmium	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.005/2.4	0.005
Copper	SW3050/SW6010	E200.7	3	0.03
Chromium	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.010/10.0	0.03

* Based on a dilution factor of 1.

**0.010/3.7 = soluble/total.

TABLE 3-1 (Continued)
CHEMICALS OF CONCERN AND
ANALYTICAL METHODS

<u>Parameter</u>	<u>Analytical Methods</u>		<u>Limits of Detection*</u>	
	<u>Soil</u>	<u>Water</u>	<u>Soil</u> <u>(mg/kg)</u>	<u>Water</u> <u>(ug/L)</u>
Cyanide	SW9010	SW9010	20	0.02
Lead	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.005/4.1	0.005
Mercury	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.0002/0.20	0.005
Nickel	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.040/24.0	0.015
Silver	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.010/8.3	0.03
Vanadium	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.050/11	0.04
Zinc	CAMWET-Title 22 CAC, Div 4, Sec 66700	E200.7	0.020/7.8	0.01

*Based on a dilution factor of 1.